TECHNOLOGY DEPT

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THE NATIONAL TELEPHONE MAGAZINE

TELEPHONE ENGINEER AND Management

MAY, 1943

We should behave to friends as we would have friends behave to us.—*Aristotle.*

LET'S LOOK AT

COPPERWELD

--THICK COPPER EXTERIOR PERMANENTLY WELDED TO STEEL CORE

COPPERWELD WIRE PROVIDES:

STRENGTH

—from the tough steel core. And the strength is permanent because the steel is protected from rust and corrosion by the thick copper exterior.

CONDUCTIVITY

The thick copper exterior (40% or 30%) provides electrical conductivity. The minimum thickness of copper is not less than 12½% of the wire radius for 40% conductivity and not less than 10% of the wire radius for 30% conductivity wire.

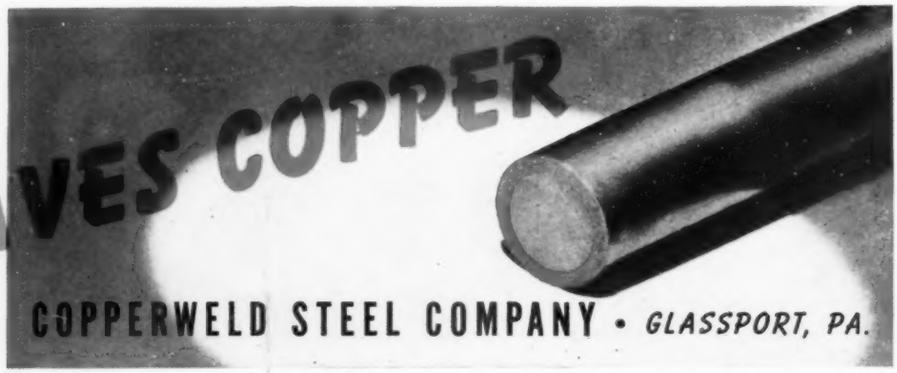
PERMANENCE

The copper and steel are permanently molten-welded. Copperweld has the rust-resisting life of solid copper.

COPPERWELD REQUIRES ONLY 30% (OR 40%) COPPER

COPPER WIRE REQUIRES 100% COPPER

-and SAVES COPPER



COPPERWELD STEEL COMPANY • GLASSPORT, PA.

Published monthly by Telephone Engineer Publishing Corporation. Office of Publication, Pontiac, Illinois; Executive and Editorial Offices, 7720 Sheridan Road, Chicago, Illinois. Telephone Rogers Park 3040. Subscriptions: U. S., Cuba, Mexico, $1.50 per year; in all other countries, $3.50. Single copies, U.S.A., 15 cents; single copy JANUARY 15 BLUE BOOK BUYER'S GUIDE, $1.00. Subscriptions should be sent to 7720 Sheridan Road, Chicago, Illinois. Entered as second class matter at the post office at Pontiac, Illinois, under the act of March 3, 1879.

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'43

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Give You

the NATURAL Advantages of P&H Northern White Cedar Poles

Large stock of P & H Northern White Cedar Poles on hand.

Poles in tank after "PENTA" immersion treatment.

—strength with light weight, easy handling, large butts for firm anchorage, inherent durability, low conductivity and neat appearance—

plus- **PENTA FULL-LENGTH Treatment**

An amazingly effective, thoroughly tested yet LOW COST treatment. The poles are completely immersed in a highly chlorinated phenol solution many times more toxic than other preservatives in common use. Insures against sapwood deterioration and termites. Non-corrosive, non-conductive, pleasing in color. The poles are clean, dry and easy to handle.

More and more telephone companies are standardizing on P&H PENTA Poles. A "Natural" for replacements in your lines.

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"STILL IN THE LEAD"

Re-enlist Your Veteran Telephones and Equipment...
...Use this
KELLOGG Rebuilding
and Repair Service Catalog
NO. 300
THIS NEW BOOK ON
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Rebuilding
FULL DATA ON
Magneto and Common Battery Telephone Rebuilding.
Rebuilding of Generators, Ringers, Transmitters, Receivers, Hookswitches, Test Sets, etc., etc., etc.
Coil Re-winding.
Switchboard Rebuilding and Repairing.
Refinishing of Telephones and Parts.
HOW KELLOGG REBUILDS YOUR EQUIPMENT
IN "LIKE-NEW" CONDITION
4 SIMPLE STEPS
MAKE IT EASY TO USE
KELLOGG Rebuilding Service
1
2
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FOR FINEST TRANSMISSION QUALITIES SPECIFY THE FAMOUS KELLOGG NON-POSITIONAL TRANSMITTER
AVAILABLE WITH MANY REBUILT JOBS...
KELLOGG
Masterphone Handsets

Just Published

Tells How to Put Idle Equipment Back into Shape for Wartime Service

Here, in 20 fact-packed pages of the new Kellogg Rebuilding Catalog are all the data you need to help you get started on a systematic telephone and equipment rebuilding program. Having old, unserviceable apparatus rebuilt to perform and look like new is an urgent necessity today for every company that wants to maintain efficient service and conserve vital materials for the war effort. This new catalog tells how Kellogg rebuilding experts take your old and idle equipment, and completely rebuild it at low cost. It lists and describes the many different kinds of rebuilt jobs available to you, and tells exactly what old parts are required.

Send for this comprehensive, complete catalog. Read about Kellogg's thorough rebuilding methods . . . about the Kellogg Rebuilt Guarantee. Learn how easy, simple and economical it is to have equipment REBUILT BY KELLOGG. Fill in and mail the coupon today.

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KELLOGG SWITCHBOARD & SUPPLY CO.

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Your Surplus Telephones, Parts, Apparatus of All Types and Kinds.

Do you have excess telephones and desk set boxes, generators, ringers, transmitters, receivers or other telephone and switchboard parts which you are not using or do not need? Kellogg will buy them for cash. Write us, listing whatever you have, and let us make you an offer.

"LIKE-NEW" DESK STANDS FROM OLD OR IDLE PARTS
OLD RELICS LIKE THIS . . .
INTO MODERN PHONES SHOWN BELOW!
REBUILT JOB NO. 1-A
REBUILT JOB NO. 1-S

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KELLOGG SWITCHBOARD & SUPPLY CO.
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KANSAS CITY, MISSOURI

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Your Name .....

Address .....

City & State .....

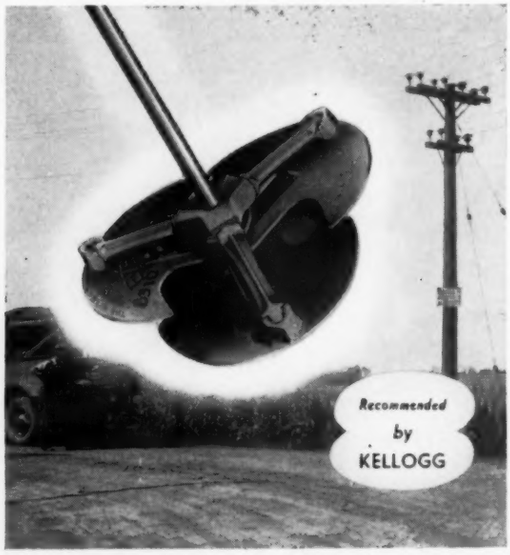
"HELLO"

A Pictorial Section of Leading Supply Manufacturers Whose Products Are Distributed by the Kellogg Switchboard and Supply Company.

Churchill Cabinet Co. First choice of many phone companies, attractive Churchill Folding Door Booths are real business producers. They are designed throughout to please patrons. Number 100 booth is equipped with electric automatic ventilator and light as standard equipment.

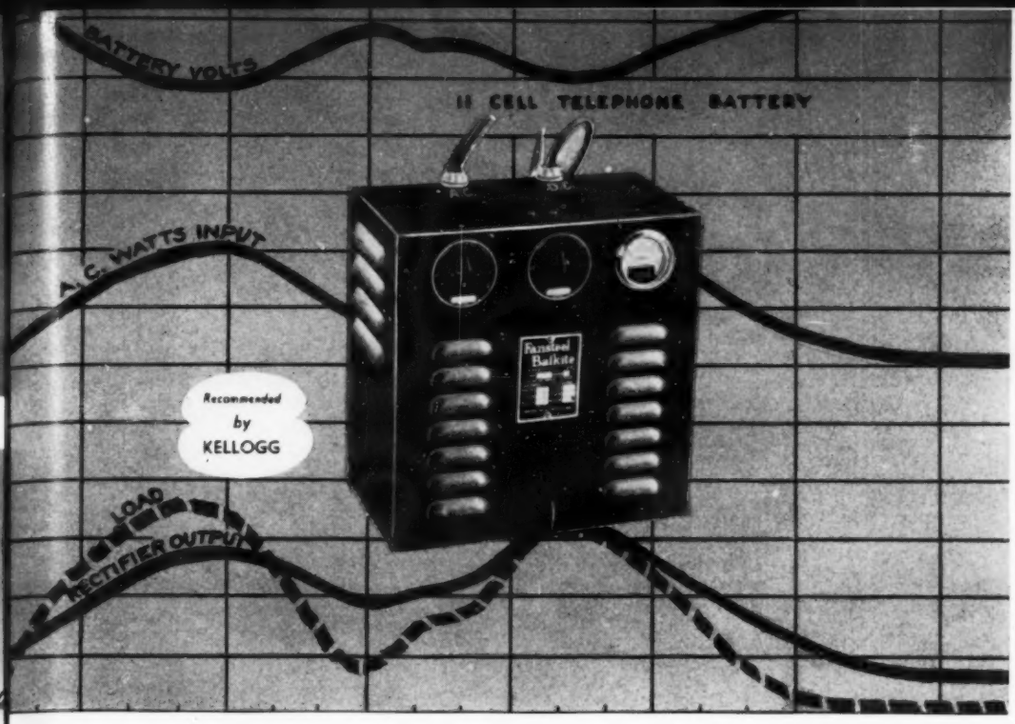
Armstrong Cork Co. Standardize on Armstrong's "Whitall Tatum" brand and you can scratch "insulators" off your worry-list for good!

Cook Electric Co. With a Cook Hi-Cap Arrester on the pole (in addition to a regular fuse type substation protector) life, equipment and instruments are safeguarded against power crosses and low maintenance static drains.

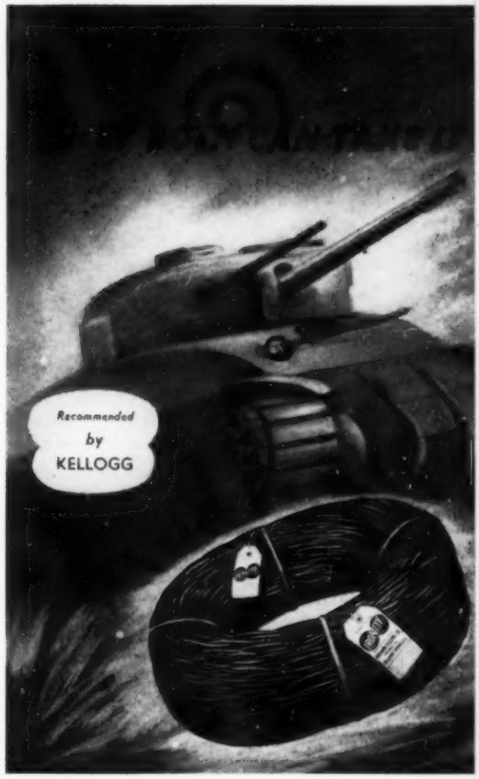


Everstick Anchor Co. Guys are "anchored for good" when you use strong, tough Everstick Anchors. They are easy to install, because of the patented nut housing which locks the anchor to the rod during installation and then permits easy recovery of the rod.

Kester Solder Co. Invaluable aid to the busy service man—that's Kester Rosin-Core Solder. Joints protected with it eliminate high resistance points and intermittent open-and-closed circuits, minimizing service troubles.



Fansteel Metallurgical Corp. There is no over or under charging when Fansteel Taper Rectifiers are used. The charge rises with increased traffic and tapers off during light load periods. Ideal for PBX, toll and small central office batteries.



Paragon Electric Co. Ironite Drop Wire is "armored" for protection against hot winds as well as sleet and ice. In addition, this quality wire saves critical metals like copper, now urgently needed for numerous war materials. Every coil is tagged for your protection.

Kellogg Switchboard & Supply Co. With telephones "worth their weight in gold" these days, they deserve every possible protection from breakage. Kellogg Koiled Kords greatly lessen the chance of cords tangling with other objects, or catching under desk corners to cause damage to instruments.

ORDER YOUR TELEPHONE LINE SUPPLIES FROM

KELLOGG

SWITCHBOARD AND SUPPLY CO., CHICAGO

Th number of diplomas for those successfully completing our Wire Chief's Training Course was indeed gratifying to the writer. They are now being mailed all over this country and to several foreign countries. These training courses have proved valuable to employer and employee alike and it is with some pride that we start a new TELEPHONE ENGINEER Training Course in this issue starting on page 25. The course is FREE to all subscribers.

▼

Thanks for your letters commending us on our coverage of the recent Executive's Conference held in Chicago. We hope to attend all the state conventions with our camera and bring you visual as well as written reports of each meeting. Although most state associations have dispensed with banquets for the duration we wish to acknowledge the invite from Joe Byrne of the Wisconsin association to be his guest at their banquet next week.

▼

I have a suggestion to offer all of the readers of this issue. It has to do with the article "The Post-war Telephone Plant" starting on page 31. It will be of value to the manufactrer of telephone equipment as well as to you telephone men. Read it and write me your opinion.

Ray

TELEPHONE ENGINEER

MANAGEMENT · ENGINEERING · MAINTENANCE

& MANAGEMENT

Vol. 47, No. 5 **MAY, 1943**

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Founded in 1909

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Rigid Specifications

HELP CUT WARTIME USE OF DROP WIRE

Monotype Drop Wire is widely recognized as the quality standard of the industry. Such eminence is not accidental but rather the result of long, tedious weeks of testing, comparing, trying and judging. Finally the nearest-to-ideal combination of materials and methods was evolved.

Eleven separate specifications are rigidly adhered to on insulation alone. The conductor is Copperweld which must pass nine exacting tests and is well-known for its great strength, resistance to elongation and torsion, as well as its high conductivity. Copperweld also helps the conservation program by using relatively small amounts of copper while giving the advantages of solid copper wire.

Obviously quality of this nature is more valuable than ever during wartime. It serves a threefold purpose by restricting replacement, saving service calls, eliminating irritating delays and failures. Your use of Monotype Drop Wire is a sound business move as well as practical patriotism.

MONOTYPE DROP WIRE

MANUFACTURED FOR

AUTOMATIC ELECTRIC COMPANY
By GENERAL CABLE CORPORATION

DISTRIBUTED BY

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1033 WEST VAN BUREN STREET • CHICAGO, ILLINOIS

INCREASES EFFECTIVENESS OF AN EFFECTIVE METHOD *of drying cable splices*

Protek-Sorb Desiccant has more than twice the moisture capacity of other desiccants—gives you added assurance that when the splice is closed—it is dry and will remain dry. You can expect a quicker return to normal because this high capacity causes almost instantaneous absorption of the moisture. Protek-Sorb Desiccant is chemically inert and non-reactive—will not attack metals, insulation or wire covering materials. Small mesh size assures perfect distribution throughout the splice.

Protek-Sorb Desiccant is approved by leading manufacturers and suppliers of telephone equipment. Your regular jobber stocks it in ready-to-use containers . . . and he can supply you with illustrated instruction sheets that show the correct procedure and the correct amounts of Protek-Sorb necessary for perfect drying.

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Industrial Chemicals Department
BALTIMORE • MARYLAND

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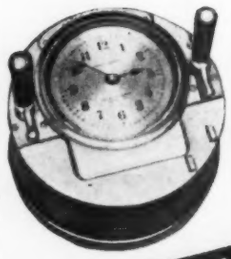


You Do NOT PAY – It Figures Toll Costs FREE

YOU PAY When SHE Does Your Figuring

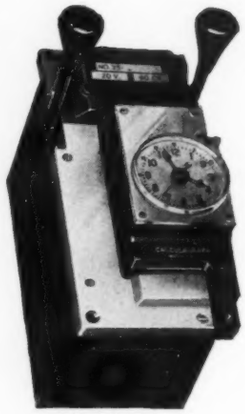
It is poor economy to pay operators to do work that a mechanical device can do cheaper and more accurately without cost.

Without cost for operation, except to pull a lever, the Calculagraph prints the time that toll calls are made and automatically figures and prints the elapsed time on tickets which can be kept for permanent records.

It can't make mistakes in figuring—can't forget.

Calculagraphs often pay for themselves in a short time by the clerk hire saved and errors eliminated. Thousands in use.

Made in electrically operated and spring-driven models. Write today for particulars.



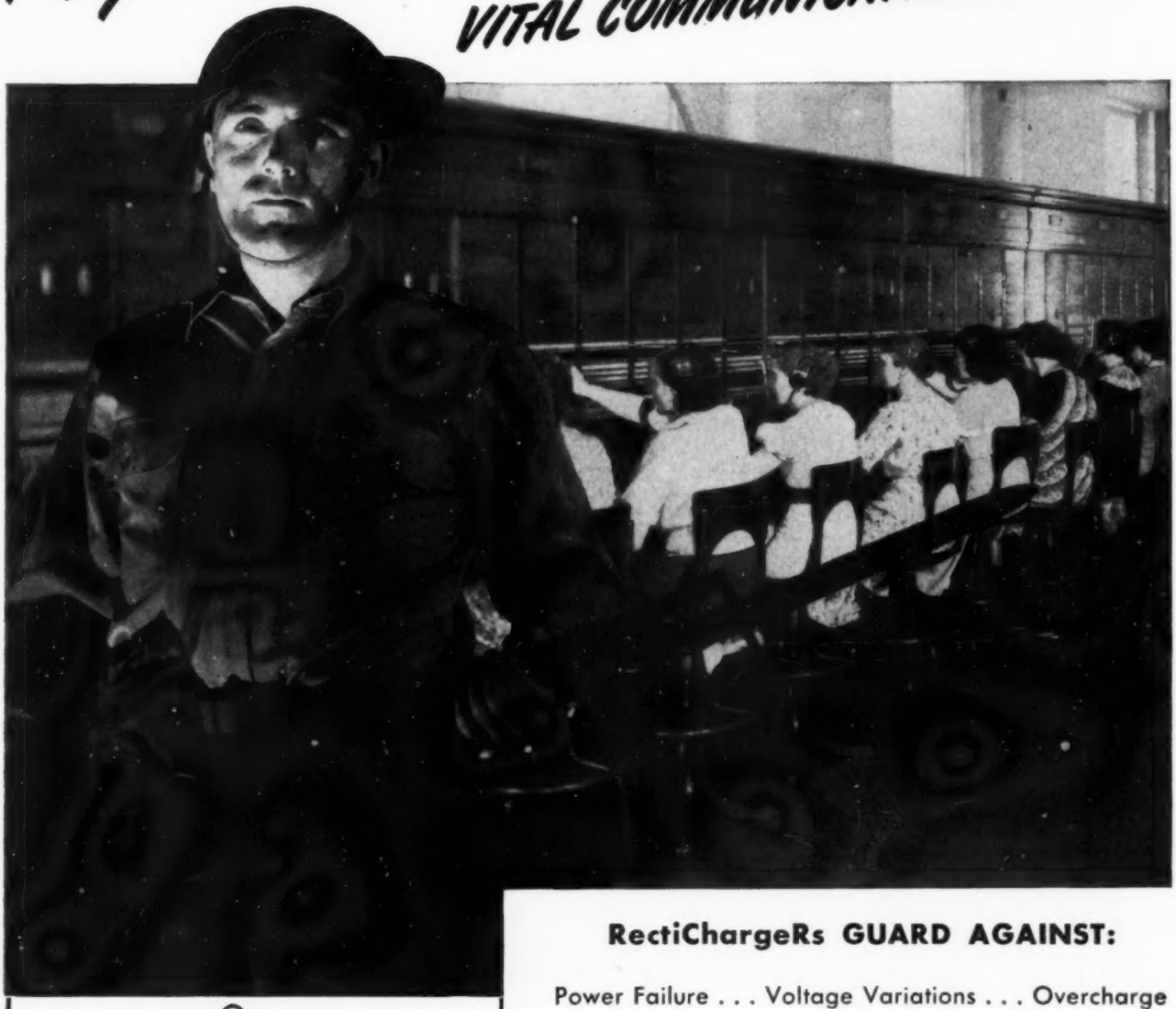
Model 33

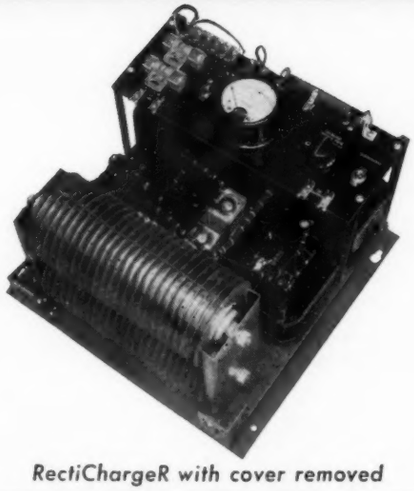
CALCULAGRAPH CO.

308 SUSSEX ST. **HARRISON, N. J.**

CALCULAGRAPH
Accurate Toll Timing to the Second!

Raytheon RectiChargeR Guards VITAL COMMUNICATION LINES





RectiChargeR with cover removed

RectiChargeRs GUARD AGAINST:

Power Failure . . . Voltage Variations . . . Overcharge and Undercharge . . . Incorrect Ringing . . . Sticking Relays . . . Short Lamp Life.

Write for descriptive bulletin

NO MOVING PARTS mean NO WEARING PARTS

Raytheon

MANUFACTURING COMPANY

190 WILLOW STREET • WALTHAM, MASS.

FIVE SHIPS FOR ORDINARY W

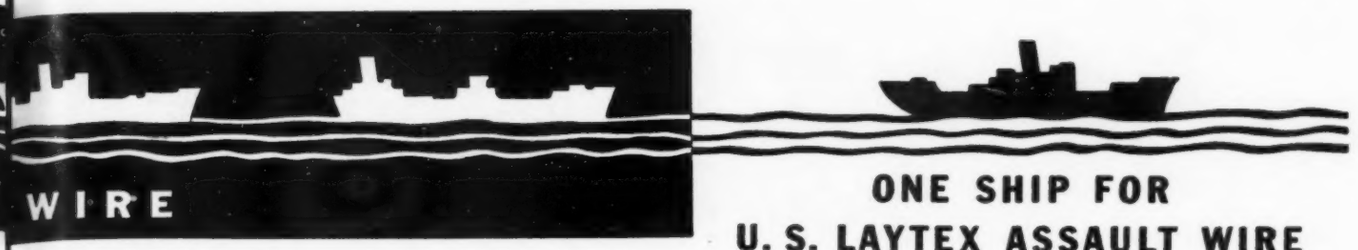
U. S. Rubber Laytex Army Assault Wire requires only one-fifth the shipping space of ordinary communication wire ...releases four times the room for men, material, food for overseas.

Light, strong and plenty tough, Laytex is the most flexible of all insulation for electrical conductors. It is waterproof, resists wide-range temperature changes...and will not shatter under concussion. Conductors are perfectly centered...because the unique Laytex Process applies the purified insulation in liquid form.

Laytex Assault Wire meets every basic requirement of the Armed Forces. It weighs less than 30 pounds per mile, twisted pair; has a breaking strength of 50 pounds per conductor; a talking distance of five miles. Millions of feet of Laytex Assault Wire are now on active duty wherever American Armies are in the field.

1230 Sixth Avenue

UNITED STATES



ONE SHIP FOR
U. S. LAYTEX ASSAULT WIRE

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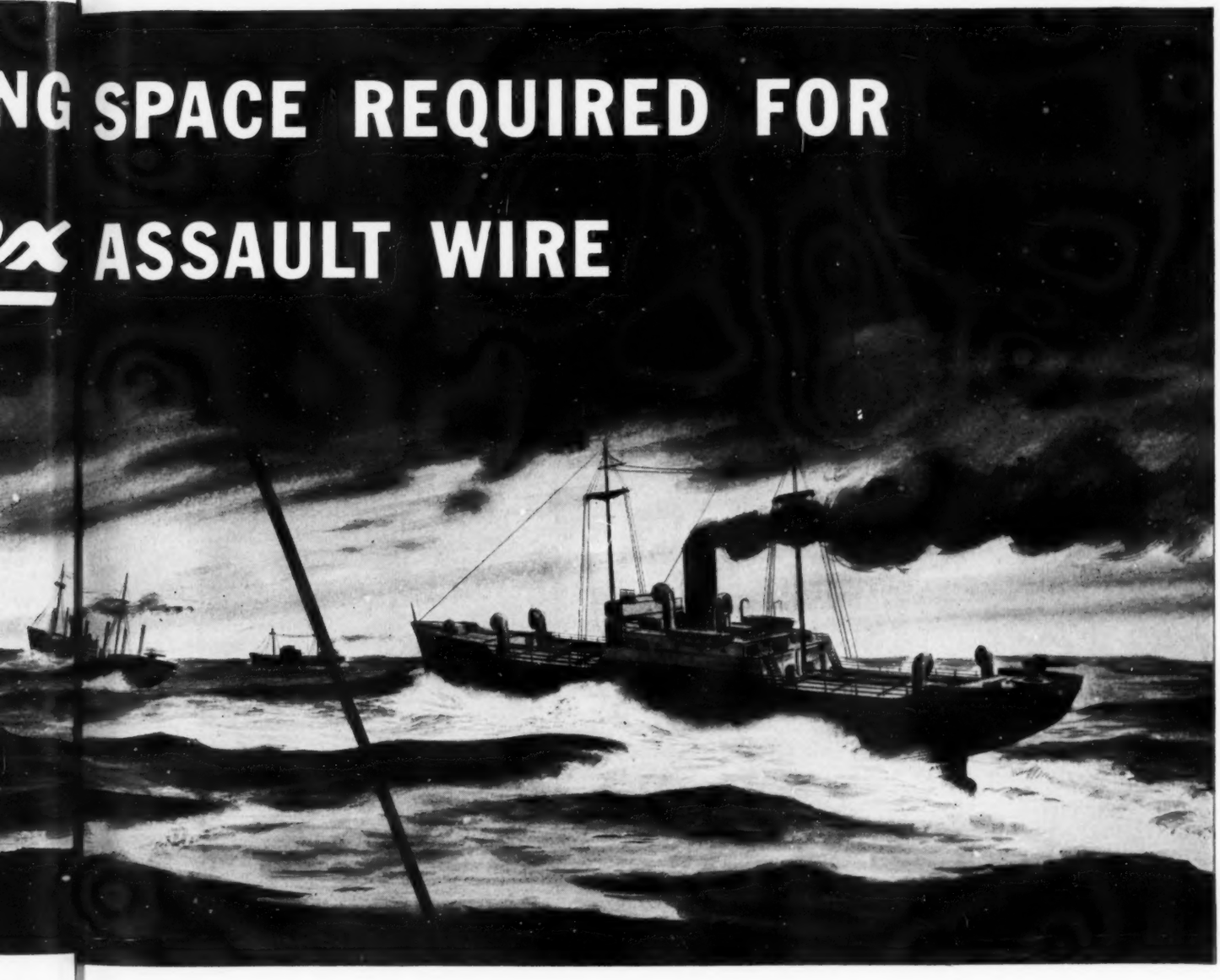
X ASSAULT WIRE



Laytex
REG. U. S. PAT. OFF

ASSAULT WIRE MEETS EVERY
BASIC MILITARY REQUIREMENT

Rockefeller Center • New York
RUBBER COMPANY

YOU GET

FULL PROTECTION AT EVERY POINT

SANDS TYPE 15 SUBSTATION PROTECTOR
SANDS TYPE 20 SUBSTATION PROTECTOR
SANDS TYPE 35 PROTECTED CABLE TERMINALS
SANDS TYPE 40 PROTECTED CABLE TERMINALS

with

SANDS

PROTECTIVE APPARATUS

Not only are Sands protective devices built to give you a wider range of protection throughout your plant but Sands equipment also gives you a greater measure of protection at each specific danger point. This is because Sands substation protectors and protected cable terminals are engineered to offer maximum protection against dangerous forces. For example: the Type 20 Substation Protector has a ¾-inch air-gap between every terminal point and the metal cover. This provides an additional guard against high potentials.

In the long run you'll find that Sands apparatus gives you *more* protection, *more* economically than any other line of protection equipment. For further information write for Catalog 4068-A.

AUTOMATIC ELECTRIC

ORIGINATORS AND DEVELOPERS OF STROWGER STEP-BY-STEP MACHINE SWITCHING AUTOMATIC DIAL SYSTEMS

MAKERS OF TELEPHONE, SIGNALING AND COMMUNICATION APPARATUS
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25 YEARS AGO THIS MONTH

Taken from TELEPHONE ENGINEER files of May, 1918.

TELEPHONE ENGINEER of May, 1918 published an article titled "Unusual Business—NOT Business As Usual," by Harold G. Moulton, economist and member of the Department of Political Economy of the University of Chicago. Mr. Moulton quoted a statement of the Liberty Loan Committee: "Luxuries and extravagance must go completely out of fashion—should, in fact, be considered little short of treachery . . ."

★

How to continue good service in the face of the increased cost of materials and labor, a larger number of subscribers and increased volume of business, due to war conditions, was the burden of discussions at Ohio Independent Telephone Association district meetings held in May, 1918. Association President Frank L. Beam at that time revealed that a survey had shown 770,670 telephones in use in Ohio.

★

According to announcement in the May, 1918 TELEPHONE ENGINEER, the holders of the stock at Mt. Horeb Independent Telephone Company at that time transferred their interests to J. A. Pratt of Menomonie Falls and J. F. O'Connell of Madison.

★

Major Garrison Babcock, formerly a consulting engineer with principal offices in Chicago, was in 1918 in training with the Signal Corps at Fort Leavenworth and was expected to sail with his battalion in the near future.

★

Twenty-five years ago W. J. Melchers of the Union Telephone Company stated that plans of the company to merge with the Michigan State Telephone Company in Gratiot and other central Michigan counties, would go through in spite of the delay of an injunction secured by the Valley City Telephone Company of Saeinaw.

Help Johnny come marchin' Home . . . .

. . . faster!

ALL of us in America today have friends and relatives in the Armed Forces. All of us want to see them marching home soon . . . with the big fight won.

An important way to help them, right here at home, is to practise rigid conservation. First, buy only the best and longest-lasting tools and equipment. Second, give everything you own the best of care, in order to get every last ounce of use. This saves materials and labor . . . sets them free to work on our tremendous armament program.

It's easy, for example, to make your dependable Exide Batteries last even longer, and four simple conservation rules will do the trick if followed carefully at all times. Obey them and you save vital batteries. Buy to Last and Save to Win.

Exide
TELEPHONE BATTERIES

THESE STEPS SAVE BATTERIES

1. Keep adding approved water at regular intervals. Most local water is safe. Ask us if yours is safe.
2. Keep the top of the battery and battery container clean and dry at all times. This will assure maximum protection of the inner parts.
3. Keep the battery fully charged—but avoid excessive over-charge. A storage battery will last longer when charged at its proper voltage.
4. Record water additions, voltage, and gravity readings. Don't trust your memory. Write down a complete record of your battery's life history. Compare readings.

If you wish more detailed information, or have a special battery problem, don't hesitate to write to Exide. We want you to get the long-life built into every Exide Battery. Ask for booklet Form 3225.

THE ELECTRIC STORAGE BATTERY COMPANY, Philadelphia
Exide Batteries of Canada, Limited, Toronto

LENZ OPERATOR'S CORDS

LOOK FOR LENZ THIS MARK OF QUALITY

Longer service plus increased durability are proven features of LENZ Operators Cords. Sturdy tinsel conductors. Durable insulation with outer braid of extra strong thread. Finest moisture-proof construction. The choice of most operators. Write today for Handy Cord Chart listing all types.

LENZ Cords, Wires and Cables fit into the War Program perfectly due to their high quality and superior performance. Keep 'em talking with LENZ.

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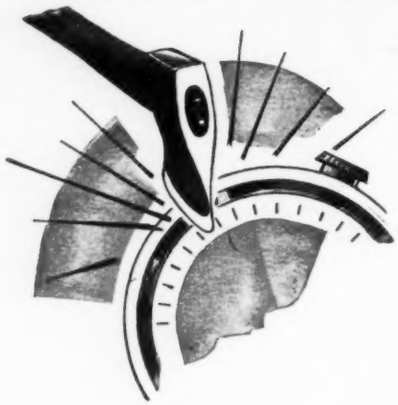
Los Angeles, Calif.

LENZ ELECTRIC MANUFACTURING COMPANY
1751 N. WESTERN AVE., CHICAGO, ILLINOIS, U. S. A.
"IN BUSINESS SINCE 1904"



SPLIT SECONDS!

for Splicing, Hanging, with NATIONAL

The faster and easier it is for you to hang your cable and make your splices and tap-offs, the less it costs you to do so. That's where National Telephone Supply Co. comes in. For downright dependability, simplicity and ease of use the "National" line has earned an enviable reputation. In cost you'll find them bracketed with the most economical.

Your use of "National" products means greater safety and longer life at less cost.

THE NATIONAL TELEPHONE SUPPLY CO.

The NATIONAL line includes: tools and sleeves for splicing, tap-offs, reducing, repairs, and dead ends; cable hangers, Marline cable hangers, Zinc-wraps and Adjust-a-Straps.

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AUTOMATIC ELECTRIC
SALES COMPANY
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They work together better . . .
because they can talk together

From a thousand feet up
The burning airdrome
Looks like
A "pushover" . . .

But
When you get
Right down to earth
It turns out to be
Anything but.

Suddenly the trees
To the right
Start throwing lead —
And your men
Are still hanging
Like clay pigeons
In their harnesses.

* * *

What a break
That you're equipped
With a
Two-way
Radio.

What a break
That you can tell your trouble
To a friendly
Fighter plane.

* * *

Today, communication equipment
Designed and manufactured
By I.T.&T. associate companies
Is helping Uncle Sam's fighting forces
Work together
On land, sea and in the air . . .

Tomorrow, the broad experience
Of I.T.&T.
In the field of communications
Will help build a better world
For every man.

INTERNATIONAL TELEPHONE AND TELEGRAPH CORPORATION *67 Broad St., New York, N. Y.*

I T&T

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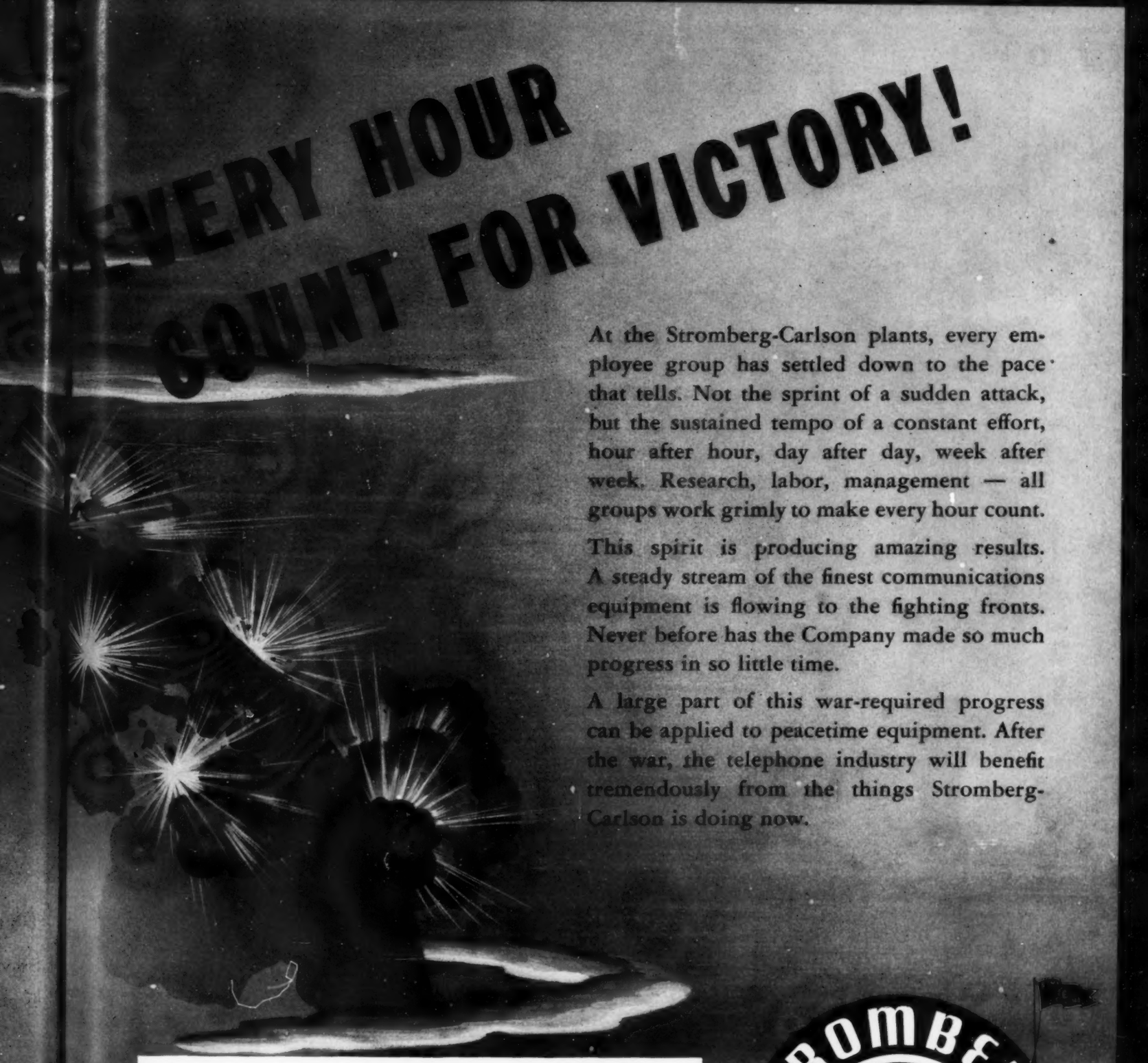
FEDERAL TELEPHONE AND RADIO CORPORATION



EVERY HOUR COUNT FOR VICTORY!

At the Stromberg-Carlson plants, every employee group has settled down to the pace that tells. Not the sprint of a sudden attack, but the sustained tempo of a constant effort, hour after hour, day after day, week after week. Research, labor, management — all groups work grimly to make every hour count.

This spirit is producing amazing results. A steady stream of the finest communications equipment is flowing to the fighting fronts. Never before has the Company made so much progress in so little time.

A large part of this war-required progress can be applied to peacetime equipment. After the war, the telephone industry will benefit tremendously from the things Stromberg-Carlson is doing now.

If you want to keep the Four Freedoms, keep on buying

WAR BONDS AND STAMPS

The purchase of War Bonds and Stamps by you and your employees is the least that can be done to keep the Four Freedoms Americans cherish. Remember, our fighting men *give* their lives—we *lend* our dollars.

Stromberg-Carlson Company, Factory, General Offices: 100 Carlson Road, Rochester, N. Y.; Branch Offices: Chicago, Kansas City, San Francisco, Toronto

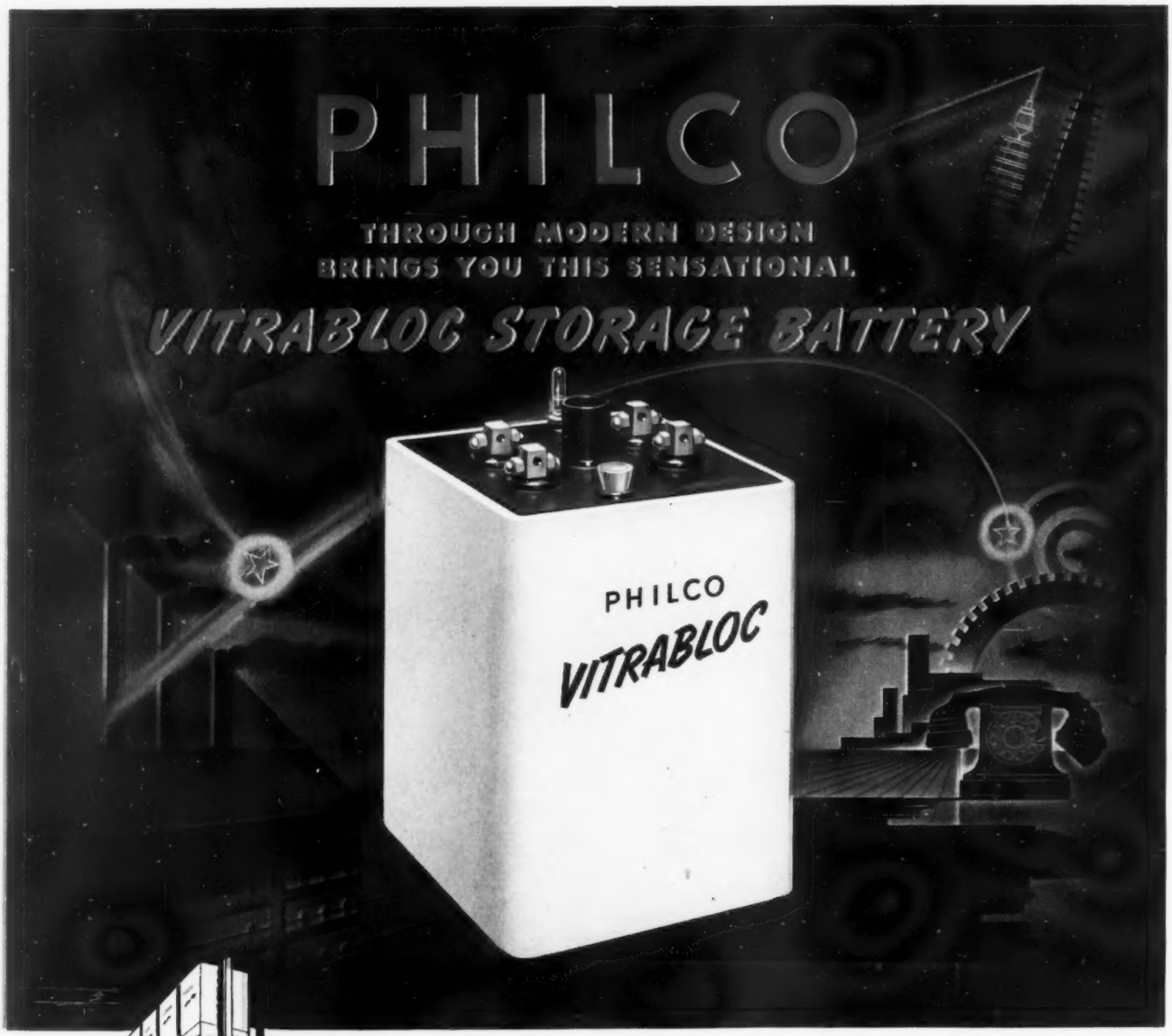
STROMBERG CARLSON

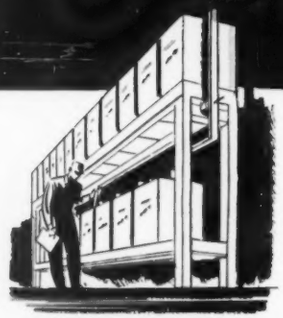
PROGRESS IN TELEPHONY

PHILCO

THROUGH MODERN DESIGN
BRINGS YOU THIS SENSATIONAL

VITRABLOC STORAGE BATTERY





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REPLACE WITH RUGGED, HIGH-CAPACITY PHILCO BATTERIES

Highlights of the Communications News

Important Communications developments of the past month, briefed for busy readers

by

ROLAND C. DAVIES
Editor, Telecommunications Reports

A picture of contrasts—Bizerte and Tunis captured six months after the invasion in North Africa by the dint of excellent military leadership and courageous well-trained airmen and ground troops; an outstanding American General, Andrews, killed in flying crash while covering his extensive European command; a Navy submarine commander wounded on deck ordering the pigboat to dive while he was swept away to his death against the political feuding and chicanery and fighting for position and power going on between high governmental officials in Washington who want their place in the sun in the RUNNING of the war, "not fighting."

Trends

THIS might seem far removed from the telephone industry and its operations and governmental relationship problems, but the trends developing out of these contrasts are of definite importance. First, the American public are fooling the bright "braintrusters" in Washington because they are assaying more and more in their mind what is going on and they are evidently fed up; witness the last Congressional elections and continued results in recent ballots such as Baltimore where a Republican mayor was elected for the first time since 1931. Second, the American people know the perfectly overall marvelous accomplishments of the Army and Navy, now developing into dividends of victories, and the almost unbelievable results of American industrial war production which came from doing and hard work not drafting of paper ideas and plans by left wingers and braintrusters. These trends are having results in Washington governmental policies—many of the important agencies are easing—and in some cases ousting—left-wing officials out of their key posts such as the recent retirements of OPA General Counsel Ginsburg, WPB Planning Chief Nathan and Deputy Chairman Fowler Harper from the War Manpower Commission who left because management representatives were getting too much power.

Results

INDUSTRY and business management that are sincerely devoted to the war effort are not going to be subject to crackdowns by governmental bodies—that phase of the New Deal appears definitely at an end. The exigencies of war, however, may well mean further tightening of the industry belt, but it will be by cooperation and consultation and practical planning. That is much along the lines of the WPB Communications Division policies of trying to have a cooperative programming of limitations and restrictions on telephone service. On May 12 such a method was carried out on Communications Division Director Leighton H. Peebles and his able aide, Division Chief Engineer Bruce McCurdy, in their staging of another session of the Telephone Operating Industry Advisory Committee which considered the growing problem of the ever-rising increases of telephone installations with its impact on the shrinking stockpile of available telephone instruments and the supply of circuits.

Post-War Planning Committee

Recognizing the importance of doing some advance thinking on post-war industry problems, the Board of Directors of the U. S. Independent Telephone Association has authorized the creation of a Post-War Planning Committee as appointed by President Porter is as follows: John R. Porter, Tarboro, N. C. (Chairman), E. C. Blomeyer, Chicago, Ill., Harold V. Bozell, New York, N. Y., Alden L. Hart, Abilene, Kans., R. A. Lumpkin, Mattoon, Ill., and John H. Agee, Lincoln, Neb.

Manpower

THE "hold-the-line" mandates of President Roosevelt have been encountering serious difficulties, primarily in their major objective to curb John L. Lewis and his strike threat for the coal mines. The major obstacles of the President's program to stave off inflationary trends were encountered by the War Labor Board in the freezing of wages to the "Little Steel" formula and the WLB's virtual existence was tottering when its labor members threatened to quit. In the termination of job shifts in essential industries to be enforced by the War Manpower Commission a state of confusion has prevailed and after much shifting back and forth the regional stabilization plan has been put into effect. **Of importance to the telephone industry may be a plan for the revamping of the present Essential Industries List (which in many places have not been observed by draft boards hardpressed to meet their induction quotas). The proposal is to create two lists—a Critical Industry List, probably the actual war production industries which would include undoubtedly the telephone and radio manufacturing industries and an Essential Service List under which the telephone operating companies would fall.**

Rate Increases

THE other side of the President's "hold-the-line" orders—his admonition to prevent utility rate increases and even to scrutinize present rate structures—has NOT yet been clarified by OPA Utilities Director Robert A. Nixon and the Federal regulatory agencies like the FCC, Federal Power Commission, ICC etc. . . The OPA Utilities Division is, however, continuing its practice of intervening before state commissions in the case of telephone rate increases sought by Independent telephone companies. It is opposing, for example, currently, rate increases, applications of Independents like the Southwest Telephone Co. of Brownwood, Texas, Ohio Standard Telephone Co., Illinois Allied Telephone Co. and Illinois Telephone Co. . . The FCC is aiding state commissions in their reviews of Bell System companies' rates in the light of last January's reduction of A. T. & T. Long Lines rates with the greater divisions of toll revenues to Independent companies and Associated Bell companies and has been releasing as an expert to state commissions its Rate Engineer Chief L. T. Hayner. The

latter is now serving with the New Jersey commission and the group of Southeastern state commissions in this capacity.

FCC Has Troubles

ALONG with several other New Deal agencies, the FCC has appeared to be out of step with the apparent shift of governmental sentiment from the leftish viewpoint to a middle-road course. The FCC has seemed to demonstrate its attitude in regard to his situation more in its relations with Congress than in any crack-down on the communications industry.

The Commission is engaging in a toughly fought feud with Congress on several fronts. The special House Investigation Committee, headed by Rep. Cox of Georgia, putting the FCC on the hot seat with its flood of questionnaires and its examination of Commissioners and staff personnel. Particularly serious to the FCC was the seizure by the Cox Committee investigators of the Commission's confidential records which cover occurences at its sessions. In addition, the Cox Committee has been delving into the purchase of radio apparatus and other supplies for the Commissioners and FCC staff officials. The FCC, of course, has been conducting investigations of the communications and broadcasting industries, notably its 1935-37 A. T. & T. Investigation, but apparently does not like the taste of its medicine.

The House Appropriations Committee is tangling with the FCC on another score—the proposal for the dismissal of two employees of the Commission's Foreign Broadcast Intelligence Service, Dr. Goodwin Watson, its chief political analyst, and Dr. William E. Dodd Jr., son of the former German ambassador and FBIS assistant news editor, who are charged with affiliations in Communist-front organizations. Although a House Appropriations Subcommittee composed of impartially minded Representatives had probed charges against the FCC officials by the Dies Committee and had determined they were not fit for government posts, four members of the FCC with Commissioners Case, Craven and Payne dissenting issued a vigorous defense of Watson and Dodd and held that they had been denied their constitutional rights by the House Committee. A rider to the Navy Department Appropriation bill in the House ordered their dismissal by the FCC and during the debate the Commission position in defense of these two employees was roundly criticized by House members.

Meanwhile, on the Senate side the Senate Interstate Commerce Committee is commencing hearings late in May on the White-Wheeler bill which would reorganize the FCC by dividing it into broadcasting and communications divisions with the chairman as the agency's administrative chief and which would revamp the Commission's procedural powers.

While all this lightning is striking around the FCC from Capitol Hill, its appropriation for the next fiscal year beginning July 1, 1943, still has not been passed by Congress. It was in the hands of the Senate Appropriations Committee during mid-May and still had to hurdle the Senate and then the House conferees. It will be recalled that in the House the FCC funds were only saved from elimination from the 1943-44 supply bill by the personal intervention on the House floor by Speaker Rayburn.

Telegraph Agreement

THE Western Union-Postal Telegraph merger agreement fashioned by the managements of those two companies is now nearing completion and during the latter part of May or early June the plan may be submitted to the FCC. After its filing the FCC will hold hearings.

During early May the executives of the international cable and radiotelegraph companies submitted to the FCC Merger Committee a formula for the division of traffic by the domestic merger. Then there was another session at which telephone, telegraph companies and labor unions presented their views on the interpretations in regard to the FCC powers over abandonments under the Section 214 amendments.

Convention Dates

Wisconsin Locally Owned Telephone Group, Park Hotel, Madison, May 18.

Wisconsin State Telephone Association, Park Hotel, Madison, May 19 and 20.

New York State Telephone Association, Hotel Syracuse, Syracuse, May 26 and 27.

Washington and Oregon Independent Telephone Associations, joint convention, Davenport Hotel, Spokane, Wash., June 18 and 19.

California Independent Telephone Association, Miramar Hotel, Santa Monica, June 24 and 25.

A QUESTION!

By an Independent Telephone Pioneer

There is a body of water 12,500 feet above sea level—has 3400 square miles. It has a vessel of 750 tons making regular trips. Where is it? (Turn to page 65 for answer.)

Study New WPB Order

THE new revision of the WPB L-183-a order for the electronic, radio and wire communications manufacturing industries and component producers, was the major subject of discussion by the Telephone Equipment and Supplies Manufacturers Industry Advisory Committee of the WPB Communications Division at its meeting May 6. The session which lasted all morning and during part of the afternoon was presided over by William F. Sloan, Communications Division Manufacturing Branch Chief. The next meeting of the Committee is June 10.

The discussion of the manufacturing advisory committee revolved mainly around the Precedence List numbers and how they were applied. It was debated whether it would be helpful to the wire telephone and telegraph equipment manufacturers to change many of the vital military communications products to the "A" Products Classification. But the unanimous sentiment was to keep wire communications products in the present "B" category despite the fact that a large percentage of the production in the wire manufacturing plants was for the Army and Navy.

The committee members present were: Fred Clarke, Western Electric; H. C. Bohle, International Standard Electric Co.; A. F. Gibson, Stromberg-Carlson Co.; C. L. Schlieskert, Cook Electric Co.; E. O. Link, North Electric Co.; M. K. McGrath, Kellogg Switchboard & Supply; E. W. Rodormer, Reliable Electric Co.; W. L. Runzel, Runzel Cord & Wire Co.; C. S. Cadwell, Automatic Electric; and R. W. Siemund of Leich Electric Co.

The new order L-183-a houses in the WPB Radio and Radar Division and Communications Division, in coordination with the Army-Navy Electronics Production agency, authority to order the scheduling of delivery for any electronic, radio and wire communication component in accordance with the Precedence List designations. In addition, the WPB may freeze schedules, reallocate unfilled orders, divert deliveries, or establish earmarked stocks of components. Prior to this revision—one of the most important WPB orders for the electronics and communications manufacturing industries—the old L-183-a order required that producers of condensers, resistors, and meters scheduled their

deliveries to conform to the Precedence List designations set for the end products. The new order applies to all electronic components and wire communications apparatus, ranging not only over the wide variety of radio equipment purchased by the Signal Corps and the Navy but also switchboards, carrier telephone equipment, teletypewriters, battle announcer and sound power telephones, spare parts groups and electronic subassemblies. The previous order applied only to the three electronic components.

(The Signal Corps and Navy, it is understood, will have appropriations for communications equipment for the next fiscal year comparable in amounts to that which they have been spending this year.)

Disestablishes Independent Union

WHILE the American Federation of Labor and the CIO have indicated that they will start intensified unionization drives in the telephone field as the result of the unanimous U. S. Supreme Court decision upholding the National Labor Relations Board's disestablishment of the Southern Bell employees' independent union, the National Federation of Telephone Workers leadership is confident that the telephone employees in the Bell System and Independent industry in their affiliated unions will not be persuaded to join either of the so-called national labor groups.

The Southern Bell employees are expected to start immediately upon the formation of a new independent union to be affiliated with the NFTW, the leading labor organization in the telephone industry. This entails the formation of a new constitution and selection of new officials not connected in any way with the disestablished Southern Association of Bell Telephone Employees. Already it has been indicated that the AFL International Brotherhood of Electrical Workers and the CIO American Communications Association (the latter with less intensity) had dispatched organizers to unionize the Southern Bell workers. The AFL and CIO might also try to enroll members in telephone ranks in other sections of the country, it was reported.

The Supreme Court upheld the NLRB in its disestablishment of the Southern Association and supported the Board's contentions that the Association had been dominated by the Southern Bell prior to the Wagner Act and that there was sufficient evidence of continued company influence to justify the NLRB findings. The decision was unanimous, being handed down by Justice Stanley Reed. Justice Owen J. Roberts did not, however, participate in the ruling.

The Supreme Court opinion followed the usual trend of the nation's highest tribunal in not questioning the administrative body's findings of fact. Justice Reed summed up the court's position by stating that "we are of the opinion that there was substantial evidence to justify this conclusion" of company domination. "Since the Association prior to the passage of the National Labor Relations Act in 1935 was obviously a company dominated and supported union," the court's opinion stated "the question of the weight to be given the passage of time or subsequent efforts to dissipate the effect of this early domination is for the Board. **Its conclusion is an inference of fact which may not be set aside upon judical review because the courts would have drawn a different inference."**

In announcing the decision in the Supreme Court room, Justice Reed stated that it was admitted on both sides that the Association was dominated by the company before the enactment of the Wagner Act and there was conflicting evidence as to the conduct of the employer after the passage of the Act. "We examined into the facts and the law," Justice Reed stated, "and found company domination prior to the Wagner Act significant. There was substantial evidence to support the National Labor Relations Board in its order." He declared that despite the weight on the passage of time there was substantial evidence for the NLRB order. He added that the Supreme Court remanded the case back to the Circuit Court to enforce the disestablishment order of the NLRB.

Are You Going!!

Two conventions are scheduled for the coming fortnight. The Wisconsin association will meet at Madison on May 19 and 20 and the New York State Telephone Association will convene at Syracuse on May 26 and 27.

The Editor wishes to suggest that all of you telephone men and women from these two states attend your annual state convention. We realize that you have always been able to run your own business in the past by tending your own business—but times have changed with the war and you must comply with all government orders now in force whether you like them or not. By attending your convention you will get the information you need to help us win this war.

Dry-Cell Batteries

A small number of dry-cell batteries for maintaining telephone service in rural areas have been made available for distribution through hardware stores and other distributors, WPB Communications Division Director Leighton H. Peebles announced early in May. At one point in the study of the situation, it was rumored an actual shortage of such dry-cell batteries existed but the shortage amounted to no more than a distribution problem which has now been met.

This action, Mr. Peebles said, will enable distributors to carry a limited stock from which owners of small independent telephone companies can obtain batteries more readily. The batteries are good for about a year's service. Distributors may obtain the batteries by submitting Form PD-IX to the Wholesale and Retail Trade Division of the WPB.

Pointing out that there is no indication of more critical metals and materials being available for the telephone industry than during the past quarter and even shorter rations are indicated, Leighton H. Peebles, Director of the WPB Communications Division, in an address May 5 at the annual meeting of the Indiana Telephone Association at Indianapolis asked the communications industry to make every pound of material and every man-hour count as far as possible. He lauded the industry for having done its share in getting along with less materials and less manpower so as to contribute to war production and at the same time maintain adequate communications. He cited that the recent easing of restrictions for telephone installations for food producing farmers would not mean any immediate further easing up of restrictions.

Mr. Peebles gave an excellent and detailed description of the operations and functioning of his Division and explained to the 200 to 250 Independent telephone executives at the meeting how they should prepare the applications for priority assistance.

The philosophy which animates the WPB and specifically the Communications Division "is one of cooperation with industry in a tremendous task," Mr. Peebles stated. He declared that the Division relied upon leadership rather than dictation in conference with the leaders of the telephone industry, the Telephone Advisory Committee, to chart the broad program which the industry should follow. He related as an illustration of the importance of communications how, in the German retreat from Stalingrad, every item of communication equipment and every mile of wire was either destroyed or removed.

"RAISING HECK"

WITH YOUR EMPLOYEES MIGHT MAKE YOU FEEL BETTER . . . . . *but*

TRAINING Them will

PROVE MORE VALUABLE

to your Company and to its Patrons!

Mr. MANAGER!

of any telephone company

The publishers of TELEPHONE ENGINEER & MANAGEMENT are cognizant of the many troubles you are having these days with an ever-changing personnel. To aid in training men to step into new or strange positions a series of training courses are being published. The Wire Chief's Training Course has just been completed . . . and TODAY (on the succeeding page) a new course, ELECTRICAL FUNDAMENTALS for the TELEPHONE MAN, is being started. Written in a simple, easily understood style and quite suitable for homestudy . . . this training course will be quite valuable to anyone desiring a good working knowledge of electrical theory.

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Date.....

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ELECTRICAL FUNDAMENTALS FOR THE TELEPHONE MAN

☆

Static and Current Electricity

PART I.

Electricity—What It Is

ALTHOUGH men have been working with electricity for many years its exact nature is still not definitely known. It is generally defined as an invisible agent through which certain effects can be produced. The ancients thought that electricity was an invisible fluid which could be made to flow through metallic wires in a manner similar to that of water through pipes. Modern scientists, however, have proven that electrical **current flow** in conductors is due to the movement of billions of tiny negative **electrons**.

We need not be so much concerned as to the exact nature of electricity but rather should endeavor to understand its action under various conditions and learn how to control and utilize it to produce desired results.

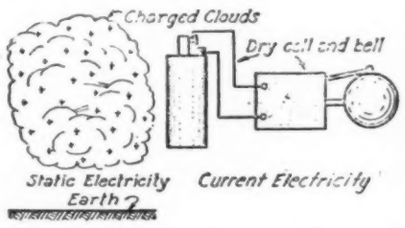


Fig. 1.—Examples of two types of electricity.

Two Kinds of Electricity

THERE are two basic kinds of electricity which are known as **static electricity** and **current electricity.**

Static electricity is **electricity at rest.** Examples of this type of electricity are lightning, charges which we produce on our bodies by scuffing our feet on thick rugs, charges on condenser plates, etc.

Current electricity is **electricity in motion.** The electricity which flows through wires and into our homes for light and power purposes is a good example of this latter type of electricity. Current electricity is the most useful of the two types and is one with which we should become most familiar.

Figure 1 illustrates typical examples of the two types of electricity.

IMPORTANT—THE PLAN

THIS course of instruction in the fundamentals of electricity has been prepared for the primary purpose of giving the small exchange maintenance man or manager and those new in the telephone business an opportunity of getting training in the fundamentals so necessary in their work. In order to encourage those who can profit by this training to put forth real effort in mastering the course, we have set up a plan similar to that used in our former Wire Chief's Training Course. Any regular SUBSCRIBER to TELEPHONE ENGINEER & MANAGEMENT may answer the examination questions at the end of each lesson and submit these to this magazine—Homestudy Division—7720 Sheridan Road, Chicago, together with 6c in stamps and the submitted lessons will be carefully corrected and returned together with printed answers which show just how each question or problem should be answered. At the completion of the Course an attractive certificate stating that the Course has been satisfactorily completed will be issued without charge. These certificates are similar to those issued by leading Homestudy Schools and well worth the effort necessary to get them. This Course was prepared and purchased for use in TELEPHONE ENGINEER & MANAGEMENT from our former Technical Editor, B. C. Burden, before he was appointed Engineer for the United States Independent Telephone Association.

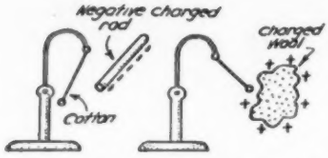


Fig. 2.—Action of like and unlike static charges.

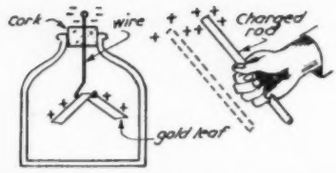


Fig. 3.—Device used to detect small electrostatic charges known as an Electroscope

Explanation of Static Electricity

WHEN certain non-metallic objects are rubbed together a charge of static electricity is created on the two objects, one becoming charged with **positive electricity** and the other with the opposite kind or what we call **negative electricity.** For example, if we rub a glass rod with a silk rag the glass rod will become positively charged and the silk rag negatively charged.

Charged objects exhibit unusual effects, for example, if a piece of positively charged wool is brought in the proximity of a small wad of cotton, which is suspended by a silk thread, the cotton will be attracted to the wool provided a slight negative charge has been imparted to the cotton by touching it with some negatively charged object as for example, a negatively charged glass rod. If after the negative charge has been imparted to the wad of cotton the negatively charged rod is again approached the cotton, the cotton will be repelled away from the rod. These two effects which are illustrated in Figure 2 are a natural phenomena of static electricity and are in accordance with two basic laws of electro static theory which state that: **like electrostatic charges will tend to repel each other,** and **unlike charges will attract each other.**

The terms **positive** and **negative** as used in connection with static electricity are merely arbitrary designations of two different and opposite electrical effects and are used in much the same way as we refer to one direction as being east and the other direction as being west in order to differentiate between the two. The term **polarity** is used in referring to these two terms.

The Electroscope

A DEVICE used to indicate the presence of static charges is the **electroscope.** This instrument consists of a narrow strip of gold leaf suspended on the end of a wire in a corked bottle, as shown in Figure 3. The operation of this device is based on the fact that when an electrostatically charged object is brought into the proximity of any metallic object it will induce an electrostatic charge in the metallic object. On the side of the object near the electrostatically charged source the induced charge will be of opposite polarity to that of the inducing charge and on the end or on the side away from the inducing source the charge will be of the same polarity. Inasmuch as the extremely light strip of gold leaf which is suspended from the hook is free to move the leaves will tend to diverge due to the repelling affect of the like charges which exist on the two free halves. It is important to note that charges are created on the electroscope even though the charging source does not touch the metal ball. This is known as **electrostatic induction.** The term induce refers to the action which takes place between two metallic objects not conductively connected.

Fig. 4 illustrates how a positively charged sphere induces a charge in a nearby metallic tube. It will be observed that positive charge on the sphere induces negative charge on the nearest end of the tube and repels a positive charge to the end away from it. The charge nearest the sphere is known as a **bound charge,** and the charge furtherest away as a **free charge.**

Gold foil is used in electro-scopes because of its extreme lightness coupled with the fact that it is a good conductor. A thin sheet of tissue paper coated with aluminum paint will work quite well in an experimental setup. Electroscopes have little practical use outside of a laboratory, or in school classrooms.

Lightning and its Behavior

ONE of the most familiar examples of static electricity with which we as individuals are sometimes concerned is **atmospheric lightning.** During the summer months prior to and during rain storms we see vivid lightning displays jumping from cloud to cloud and from cloud to earth. These lightning bolts if they happen to pass through wooden or other partially conducting objects, often completely wreck and tear apart the material through which they pass. When they pass through the human body they almost invariably kill the person that is struck. Let us examine the causes of as well as some of the precautions that should be taken against lightning.

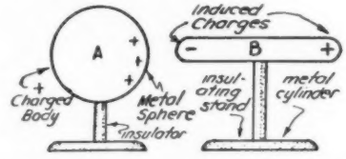


Fig. 4.—Action of a charged object on a nearby charged object.

Cause of Lightning

LIGHTNING is due to raindrops which move about in the air often ascending on vertical air columns to great heights. In the process of this vertical movement and also as the result of splitting up into smaller particles, raindrops acquire an electrical charge. This charge is released to and stored in the huge bodies of moisture laden air which we call clouds and which are always in evidence during thunder storms. As a result of the millions of electrically particles of which these clouds are composed, the total amount of electricity stored in them reaches a tremendous value. As soon as the electricity stored in the cloud reaches a value great enough it jumps to earth or to some nearby cloud, thus discharging the electricity stored. Fig. 6 illustrates this theory.

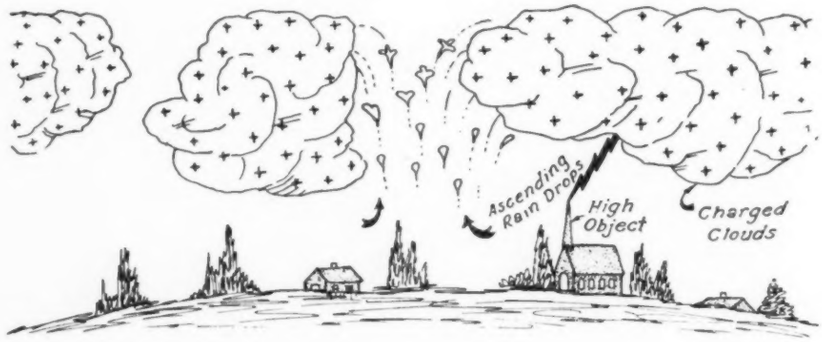


Fig. 6.—Theory of lightning.

Electricity on its way to earth from a cloud seeks the easiest path; that is, the path which will offer the least **resistance** to the electrical current. High objects such as church steeples, trees and tall houses are therefore much more apt to be struck than objects which are much lower in height.

Tremendous Energy

THE amount of electrical energy and the **voltage** represented by a single lightning discharge is almost unbelievably great, and a single discharge often represents **millions of volts** of electricity. If lightning passes through wood it often completely tears the wood apart. It is thought that this is due to the explosive force of the steam which is generated in the wood as a result of the instantaneous heating due to the high current which passes through it, as all wood even though apparently dry, contains some moisture.

Lightning Superstitions

THERE are many superstitions regarding the effect of lightning and as to what precautions should be taken during lightning storms. Many people believe that they are perfectly safe if sleeping in a featherbed; others contend that one should never stand near an open window. The real truth of the matter is that one should always remember that **lightning will seek the best conducting path to the ground** and for this reason a person should not stand near water pipes, stoves, chimneys in the home, or under trees, near telephone poles, or directly in front of high buildings, if out of doors. Fig. 7 shows how lightning tends to follow metallic objects to ground.

Danger to Farmers

EVERY summer many farmers throughout the world are killed or seriously hurt by being struck by lightning. At first thought this seems quite a coincidence that a farmer plowing on a large field should be singled out by lightning and struck down. The reason, however, is evident when one considers that a human being (or livestock) is a fairly good conductor and a man riding on a plow or walking in a field is 5 or 6 feet higher than surrounding objects; hence, lightning in taking the shortest path to earth naturally passes through the man's body. Cases have been known where lightning hit a tree containing over a hundred blackbirds and killed every blackbird in the tree.

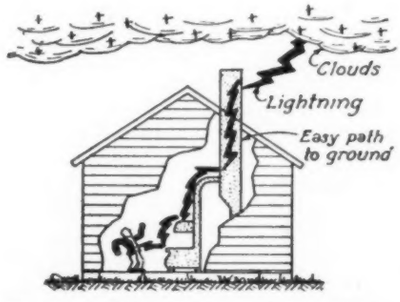


Fig. 7.—Lightning follows metallic paths to ground.

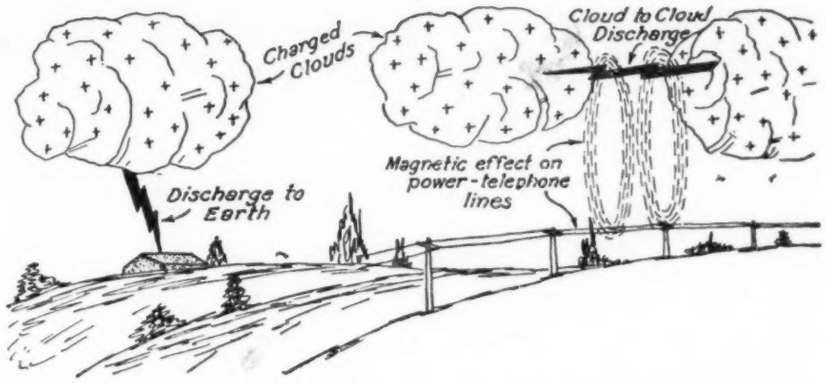


Fig. 8.—Induced charges on telephone and power wires due to nearby lightning discharges.

Induced Charges Due to Lightning

LIGHTNING does not necessarily need to strike wires of telephone and power companies to create a high voltage in them, as it may strike in a nearby field and the resulting magnetic and electrostatic fields due to the high current flowing induce high voltages in the power and telephone lines which may blow fuses and cause other trouble. This is illustrated by Figure 8.

Similarly, a person may not actually be struck by lightning and yet may be stunned by a nearby bolt discharging to earth. In the latter case, however, the bolt must strike quite close in order to induce sufficient current in a person's body to be noticeable.

Measurements by the Bureau of Standards have shown that heavy discharges to earth may induce voltages as high as 150,000 volts in nearby objects.

Generation of Current Electricity

LET us next concern ourselves with current electricity which is the useful more common type of electricity which we encounter in our daily lives. This type of electricity as has previously been stated represents electricity in motion.

The two principal methods of generating current electricity are:

1—**Chemical action** by means of dry cells or storage batteries.

2—**Electromagnetically** by means of generators, which sweep a large number of copper conductors through an intense magnetic field.

Building up our story of electricity, it is necessary that we refer now to some electrical terms which are not explained fully until a later section of this book. In order to avoid confusing the reader some of the terms will be briefly explained as we come to them. For example, when we speak of **current** we have reference to the quantity of electricity which flows through our electrical circuits. When we speak of **voltage** or **potential**, we refer to the pressure that is necessary to force electrical current through a circuit. **We cannot have current without pressure, however, we can have pressure without current.** This is analagous to the conditions in a water system in which pressure must exist in order to cause the water to flow through the pipes, however, when water faucets are closed no water flow takes place, yet pressure is available ready to cause the water to flow out of the pipes through any path that may be provided. Fig. 9 shows a large 3000 K. W. generator and a transformer substation.

Chemical Methods

ELECTRICAL current may be generated by immersing two dissimilar metal plates (such as zinc and copper in dilute sulphuric acid) in a liquid or semi-liquid solution. When the two plates are connected together extern-

(Please turn to page 44)

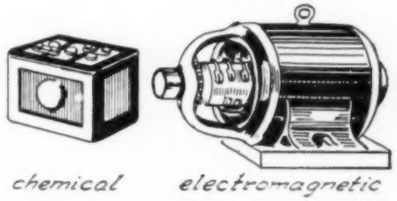


Fig. 10.—Two principal methods of generating electricity.

J. T. Carliss of Marion (left) newly elected president of the Ohio Association, receiving congratulations from Gustav Hirsch, retiring president. Colonel Wm. C. Henry, Frank L. McKinney and Loren M. Berry make an excellent background for the gesture.

Ohio *Holds Well Attended* War Conference

With a surprisingly large attendance, President Gustav Hirsch, president of the Ohio Independent Telephone Association, called the 48th annual convention of the association to order Tuesday afternoon, April 27, at Columbus, Ohio. President Hirsch said the meeting should be termed a War Conference instead of an ordinary annual convention and the speakers and the tenure of their texts would be along such lines.

Changes in officers and directors for the ensuing terms were: J. T. Carliss of Marion succeeded Gustav Hirsch as president; Herman E. Hageman, Lorain; H. W. Hauss, Watakoneta; Gustav Hirsch, Columbus; David McC. McKell, Chillicothe, whose terms on the Board of Directors was expiring, were re-elected. Roy Ammel of Elyria was elected to the Board. The following men comprise the balance of the Board: A. S. Crane, Portsmouth; Henry George, Ashland; Ralph Mateer, Warren; J. W. Safford, Troy; R. E. Shotts, Columbus; John Sidlo, Cambridge; Russell Goebricher, Conneaut; Wm. C. Henry, Bellevue; C. L. Jones, Athens; Frank L. McKinney, Columbus; E. G. Morgan, Eaton, and L. R. Wittemire, Mansfield.

Frank L. McKinney remains the popular and efficient secretary-treasurer.

Ohio Governor John W. Bricker was speaker of the evening at the banquet given during the evening of the first day. Dancing followed.

Following J. Warren Stafford's response to the address of welcome by James A. Maddox of Columbus, President Hirsch went immediately into his report covering the 48th operating year of the association.

He said: "Our country has been at war throughout the past year, and we of the telephone industry, have been functioning as an indispensable unit in a vast mechanized war time economy. Because of the demonstrated efficiency of our companies, and the proven abilities of telephone managements, communications services have continued in private hands, although subject to close supervision and to a multiplicity of military and other governmental controls.

"Throughout the year, the keenest and most critical eyes in the country have been watching the performances of the telephone industry, which, by reason of the large number of persons it employs, and the immensity of its material requirements, presents the most tempting prize known to bureaucracy."

Mr. Hirsch then reviewed 1942's activities of himself, of Vice President Colonel Wm. C. Henry and of association Secretary-Treasurer Frank McKinney in cooperating in the fullest measure with every branch of military offense and civilian defense. He spoke proudly of the wonderful reports coming in regarding the men and personnel furnished the government from the Ohio telephone group.

President Hirsch followed with a resume of business difficulties during the past year. He said:

"Our operations during 1942 and thus far into 1943, have been performed under conditions that a few years ago would have been classified as intolerable. We have been saved from disaster, and the general public from a breakdown in communications services, only because of a happy combination of circumstances.

"The distressful factors that we have encountered, include a growing shortage of trained manpower and womanpower at all points of greatest industrial demand for our services; increasing scarcity of all materials and equipments necessary to telephone operation; mounting expense of labor and telephone plant replaced or installed; inflexibility of rate structures; and the ever increasing burden of taxation and paper work that is being placed upon the telephone business by the government.

"Few of our subscribers understand or appreciate the discrimination that is being practiced in their disfavor, by federal and state governments. The former collects a burdensome special levy from all telephone users, rich and poor, urban and farm dwellers alike, for no apparent reason, other than that the companies are helpless to avoid serving as deputy tax collectors, and can be used to exploit their customers. There is apparently little that the companies can do at the moment about these taxes, other than to protest them for the benefit of the record.

"In the face of these discouraging conditions," Mr. Hirsch continued, "our business has been able to survive and expand its services, by reason of an almost universal improvement in its use of mechanical and human coordinates. During the abnormal period that lasted for a decade, prior to the outbreak of war, our companies carried on a program of replacement and rehabilitation that prepared them for the struggle that is now going on. Because we looked ahead and acted wisely during a time of depression, we are now able to fulfill our duty to our country, as well as our obligations to individual subscribers. Would that some of those who challenge the wisdom of private initiative could say as much at this time."

Frank L. McKinney, association secretary-treasurer, followed with a financial report of the association and a plea for all companies to pay particular attention to their public relations at this time. Mr. McKinney reported in part: "Your Association has often urged that you maintain membership relations with local business and service organizations. These relations are now of increased importance, since so many businesses are being liquidated by harsh war necessity or by arbitrary authority. At an unpredictable future date, this country is going to meet the confused anger and despair of a host of individuals who were formerly prosperous business men and women, and who have been dispossessed by war powers. This is going to be a bitter and peevish group, that for awhile at least will hate every other group that is not equally miserable with themselves.

"We are going to need friendly general public, and a friendly business public, more than ever before. One way to have them, is for the leaders identified with the telephone business to lend their hands and their minds, in unselfish service to local trade, commerce, and agriculture, throughout the duration, and for some time after hostilities have been concluded."

"News From Washington" was interestingly presented to the assembly by USITA Vice President Clyde S. Bailey, Washington, D. C. Randolph Eide, president of the Ohio Bell Telephone Company, Cleveland, following his annual custom, addressed the group on the subject "The Post War Outlook."

Registering at the Ohio convention: at the desk, Hal McNaughton, Muncie, Indiana; Geo. W. Crammond, Cincinnati; Randolph Eide, president of Ohio Bell. Standing in the rear facing camera, Clyde S. Bailey, Washington and Frank L. McKinney, secretary of the Ohio Association. Marcella Saas adds a touch of beauty to the picture as she awaits registration cards.

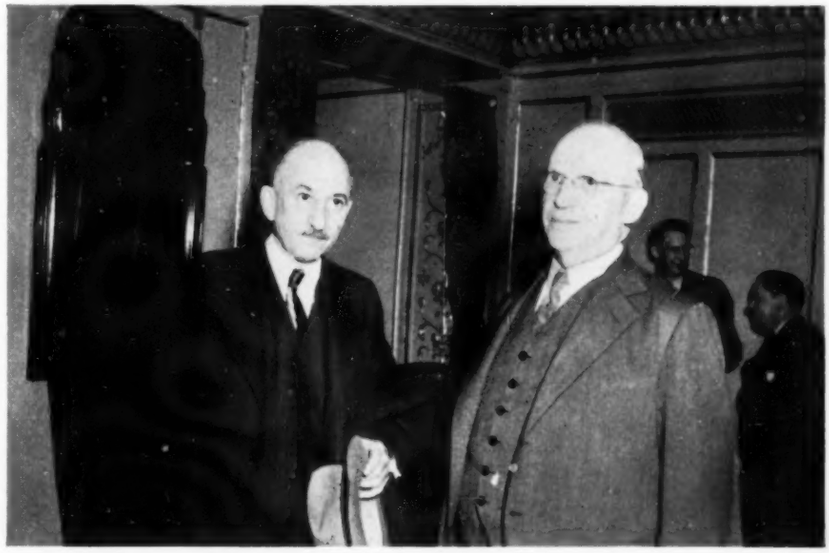
Colonel Wm. C. Henry, chief engineer of Army Communications, and vice president of the Ohio Association gave the convention a graphic picture of "The Telephone Industry at War." Colonel Henry represented Major General Dawson Olmstead, Chief Signal Officer, Washington, D. C.

The second day's session was opened with an address by F. T. McNamara, deputy director, Communications Division, WPB, pinch-hitting for Leighton H. Peebles, Director of Communications, who was unable to be present.

The subject of Mr. McNamara's address was "Relationship of the WPB to the Telephone Industry."

Mr. McNamara stated: "The relations of the telephone industry and the War Production Board have been very friendly. This happy state of affairs is due, in no small measure, to the splendid cooperation which the Board has had from the industry representatives, the Telephone Industry Advisory Committee. In cooperation with this Committee, the Board has laid down a broad general policy of conservation and service which might be summarized in ten rules. Each operator shall—

1. Conserve scarce and critical materials.
2. Discontinue the further installation of residence extensions.
3. Discontinue placing open copper wire in exchange line plant.



C. B. Russell of Columbus and Dr. C. L. Jones of Athens, reminiscing. Dr. Jones was a director of TELEPHONE ENGINEER for many years.

5. Limit replacements to the mini-essentials
6. Limit replacements to the minimum essentials
7. Limit the length of drop wires
8. Set up a preferred class of customers—Schedule A—for whom service is essential to the War Program
9. Reserve facilities for the use of Schedule A customers, if necessary
10. Regrade service, if necessary, for Schedule A customers.

Other addresses included "Ohio's Utilities and the P.U.C.O. in War Time" by George McConnaughey, Public Utilities Commission of Ohio, Columbus, and "The Telephone and Civilian Defense" by Colonel Robert S. Harsh, U. S. Army Liaison Officer, Ohio Council of Defense, Columbia. James Huffman, OPA counsel, Columbus spoke on the subject "The OPA and the War Effort." He was followed by Frank C. Dunbar, Jr., Columbus attorney, with an equally timely address, titled "War and Post War Tax Problems of Utilities."

The closing address of the final session was that of Loren M. Berry, past president of the U. S. Independent Pioneer Telephone Association of Dayton, Ohio. His subject was "Conservation and Economy in the Directory Department."

In his address Mr. Berry outlined the cooperation that his company, L. M. Berry & Co. was giving the WPB and the telephone industry. In reporting his activities he said:

"Our Company has furnished the W. P. B. directory studies with work sheets indicating paper savings on individual directories ranging from 10% to 30%, and we are still working on these studies because our directories are scattered over a wide territory, and in many cases it requires considerable time to get the information as we do not have the figures to work with, because the printing contracts are let by the Telephone Companies. However, I have reason to believe that the steps which we have taken have met with the approval of the W. P. B., and that continued cooperation on our part and on the part of the Independent Telephone Companies throughout the country will obviate the necessity of any further orders from the W.P.B. in reference to this matter unless the paper supply suddenly becomes threatened again with a serious shortage.

"After talking with the W.P.B., I immediately wrote to Mr. Clyde Bailey and enclosed a memorandum listing nine savings methods for reducing paper stock requirements for directories. 8 of these suggestions were published in a USITA Bulletin dated March 19th and sent to all Member Independent Companies. The 9th suggestion related to the life of the directories, that is the lengthening of the directory period, which can be done without difficulty in many communities, but is not practicable in many other exchanges due to traffic conditions, lack of switchboard space, etc.

"Our Company has issued a booklet indicating how the greatest paper savings can be accomplished."

Hoosier Telephone Men Hold One-Day Convention

R. V. Achatz, Aurora, president; W. H. Van Horn, Logansport, vice-president; and W. H. Beck, Indianapolis, secretary and general manager.

The 24th annual convention of the Indiana Telephone Association was held May 5 at the Claypool Hotel in Indianapolis. It was a one-day meeting, registration beginning at 8:30 A. M. and the convention proper being called to order at 9:30.

A really full day of business was the order of the program with only a brief time-out period for luncheon. Officers and directors of the association expressed themselves as highly satisfied with the attendance which at all times filled the convention hall.

All officers of the Indiana Association were reelected for the coming year. These were as follows: president, R. V. Achatz, Aurora; first vice president, W. H. VanHorn, Logansport; second vice president, R. D. Pontius, Rochester; and secretary-treasurer and general manager, W. H. Beck, Indianapolis.

Directors likewise were reelected The only exception was the election of G. J. Welborn, Princeton, who will fill the vacancy left by A. L. Greenman. A complete list of Indiana's board of directors follows: Frank E. Bohn, Ft. Wayne; R. F. Lucier, Warsaw; G. O. Perry, Terre Haute; R. D. Pontius, Rochester; G. J. Welborn, Princeton; R. V. Achatz, Aurora; F. O. Cuppy, Lafayette; C. D. Ehinger, Decatur; W. J. Scheidler, Greensburg; LaMar Stoops, Nappanee; J. F. Carroll, Indianapolis; John Harbaugh, Sullivan; Max F. Hosea, Hope; V. W. Robinston, Winchester, and W. H. VanHorn, Logansport.

Vice-President. R. D. Pontius.

First speaker of the morning introduced by R. V. Achatz, was Frank E. Bohn of Ft. Wayne. Mr. Bohn, in his address "Your Part in the Communication Offensive," presented a highly inspirational talk for all independent telephone men. Following this Mr. Achatz, acting as moderator, conducted a panel discussion on "Wartime Telephone Problems." The first subject discussed was "Commercial Problems" under the direction of Fred F. Marston, Indianapolis. "Plant Problems" was discussed by E. S. Welch, Seymour; "Personnel Problems" by Louis Shepherd, Madison, Wis., and "Executive Problems" was the subject of Mr. Achatz' talk.

W. H. Beck, secretary of the association, concluded the morning session with his annual report.

In the afternoon session which followed a directors' meeting at noon, Clyde S. Bailey, vice president of the USITA, spoke on the subject "Washington Developments;" and the address of Leighton H. Peebles, director, Communications Division, WPB, Washington, D. C. was entitled "The Communications Division of the War Production Board."

W. V. Kahler Named

Appointment of William V. Kahler as assistant vice president of the Illinois Bell was announced recently by W. O. Kurtz, vice president in charge of operation. He will assist Mr. Kurtz in handling the increased load on the operating job growing out of the war's effect on their business.

Mr. Kahler rejoined the company following his resignation as director of the Bureau of Construction of the War Production Board. Except for an interval of a few months in 1941, he has been serving in various key positions in the country's national defense program since the summer of 1940.

By B. C. BURDEN,
Engineer, United States Independent Telephone Association

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MANAGEMENT

ARTICLE

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The Post War Telephone Plant

With emphasis put on post-war planning during the recent Executive's Conference of the USITA we think the address of B. C. Burden, Engineer of the USITA and former Technical Editor of TELEPHONE ENGINEER, should be of unusual interest to every telephone man. Manufacturers should also find the article quite enlightening.

Justification for Post-war Planning

ONE of the popular current pastimes for anyone who can assemble an audience is for the speaker to put on the flowered robe and jeweled turban and gaze long and wistfully into the crystal ball and then break forth with some breath taking prophecies of things to expect in the post-war world.

When anyone starts talking about post-war planning the skeptics promptly point out that we had better first win the war and save our planning for afterwards. This may be good advice for a General on the battle front, but it does not fit the situation here at home.

We in the telephone field should be particularly concerned with post-war planning. Assuming there is some substance to the glowing prophecies of amazing new developments expected in other industries after the war, we may find ourselves in a post-war world which is new and spectacularly different. We certainly want to make sure that we fit into this new Utopia.

What is all this talk we hear of the **shape of things to come?** In general it involves helicopters that fly straight up, backwards, or sidewise, and that will be as safe as the family fliver and sell for less. It concerns beautiful plastic homes that can be set up in a week; of high octane gasoline that will give us forty miles to the gallon and performance unheard of in the past; of automobiles that are like something from another world; of super-highways; of television; and of radio facsimile newspapers. Now is all of this just idle talk or does it have some foundation in fact? I think it is more than idle talk. Take the helicopter for example, only a few weeks back an eastern airlines applied for a post-war franchise to operate fleets of aerial helicopter taxi cabs between outlying airports and downtown locations in many of the principal cities. They must be doing some post-war planning.

Unquestionably there will be a remarkable change in our way of life in the years following the war. This statement is predicted on the marvelous developments taking place in aviation; of the new techniques in plastic molding; in the tremendous increase in the production of magnesium, aluminum, and steel; the development of remarkable new alloys; and of production lines that are capable of producing consumers goods at unheard of capacities and efficiencies.

A single statement in a recent magazine shows the wide difference between this war and the last one in the matter of mechanization alone. In the last war an average infantry division required 3,300 horsepower, but in this war the requirements are for 400,000 horsepower—an increase of over 12,000%. You may well ask, "What has all this talk got to do with the telephone business?" Actually not very much—but it does indicate a trend that should not be overlooked.

Let's go at our job of speculating on things telephonic on a step by step basis. First let's talk about Electronics.

The Coming Electronic Era

FIRST let us consider the effect of war-time electronic developments on the telephone business.

If we are to judge by World War No. 1, I would say very little. But World War No. 2 is a different kind of a war. Communications is a major item. Whereas the field telephone was the backbone of the communication system of the last war, the radio is the main stem of this one. Field telephones are still in use. They are still important. But radio occupies the spotlight.

Anyone can safely predict that the radio will never completely replace the telephone. But I would hesitate to say that in the post-war period it will not supplement the telephone much more than it has in the past. This conclusion is based on two factors, viz:

(1)—The extensive development work which has and is taking place in the ultra-high frequency radio field.

(2)—The possibility of regulatory bodies wishing to impose radio in some form or other on the telephone field.

Commissioner Fly of the FCC recently told a press conference that even automobiles would be equipped with telephones after the war.

Ultra-high frequency radio techniques can be applied to some telephone applications particularly well because of the possibility of "beaming" or focusing the waves. The limited distance range of the ultra-highs makes them effective for local use.

There are several ways in which ultra-high frequency radio might be used in the telephone field, viz:

(1)—For short distance toll channels say between towns up to 50 miles. The chief advantage of this arrangement would lie in the reduction in line maintenance costs. Continuity of service during storm conditions would also be a worthwhile advantage. Disadvantages would run to the higher degree of maintenance skill required, and the lack of secrecy which would result unless scrambling equipment was used. From an equipment standpoint, the cost of the required radio apparatus should be less than the cost of open wire circuits which the radio link would displace. Such an arrangement would be most attractive where only one or two circuits between two points were required.

(2)—Offering some complications but more interesting from a speculative standpoint is the possible use of ultra-high frequencies for serving a group of farmers who could not otherwise be economically served because of distance from the C. O. Such groups could be served either by a transmitter located at the telephone office, or via a pole-mounted transmitter located at the end of an open wire feeder line near the center of the rural area to be served. The amount of apparatus to be required at each individual subscriber station would not be large and should not cost more than a good radio. The principal technical difficulty would be the matter of signalling. Stations could readily be operated on a party line basis. The chief disadvantage of such a plan would be the necessity for keeping the receiver tubes in operation 24 hours a day in order to be ready to receive incoming calls. It would also be imperative that the farm be served by a commercial power source to make the use of the radio **transciever** possible.

Telephone Repeaters

SO MUCH for radio. Let's look at some of the other post-war possibilities of the vacuum tube in the Independent Field. Take first the telephone repeater. Here is a device that was using vacuum tubes long before the radio was out of knee pants. Yet, characteristic of the stability of the telephone field, repeaters have changed but little in the last 10 or 15 years. They have, of course, been improved but they still use much the same basic circuit and arrangement as when first conceived.

Repeaters have in the past been used almost entirely for medium and long haul toll circuits. That will probably continue to be their major use. There are many Independent companies that could greatly improve their short haul toll service by the use of a simple inexpensive compact repeater.

Peculiarly, telephone repeaters have found little use in local exchange work.

In the first place it has for the most part been possible to get satisfactory transmission without them. And unfortunately the vacuum tube is a one way device whereas we are in a two way business, hence, a vacuum tube cannot be so easily applied to telephone lines as it can to public address and radio circuits.

Anyone who works with repeaters knows that the maximum gain that could be obtained on a repeater placed in the cord circuit of an exchange board would not be high because of the poor balance that would exist. It would, however, be sufficient to more than double the received volume in many cases.

However our improved knowledge of vacuum tube techniques and balancing arrangements may permit equipping switchboards of the small exchange with a fixed gain repeater in each link or cord circuit. The use of such repeaters would have several advantages such as enabling the use of smaller gauge cable in the town plant or longer runs of cable out into the rural district to reduce heavy open wire leads. A greater amount of buried rural wire could be used. Long and heavily loaded rural lines would talk up better.

The general upgrading of transmission possible by fixed gain cord circuit repeaters would be helpful to many small plants that do not have modern high efficiency subsets. Here's something for the manufacturers to shoot at.

Carrier Telephony

CARRIER telephony has always appealed to telephone operators as it apparently gives us something for nothing. That is, we think we are getting something for nothing until we pay for the terminal equipment

(Please turn to page 48)

A War Time Message to:

All Telephone Companies—

On January 8, 1943 the War Production Board issued Limitation Order L-241 which directed, with certain limitations, that the use of all paper used in printing matter, be reduced in weight so that for the first quarter of 1943 not in excess of 90% of the amount of paper would be used that was consumed in the first quarter of 1941, the base period.

Our organization speeds the work of selling telephone directory advertising, lessens man-hours, cuts waste time, and saves telephone companies money—just the advantages you want today. Are you getting the most out of your telephone directory advertising? Call or write us . . . Perhaps we can point out methods which will result in substantial increased profits or savings for your company in manpower or money.

This order directly affects your telephone directories.

Today WPB suggests that a further reduction in the use of paper is necessary to possibly forestall another curtailment.

Our organization foresaw the curtailment of paper stock looming some twelve months before the Order L-241 was issued . . . and started directing thoughts toward meeting the situation when it arose.

As a result of this planning and our years of experience publishing telephone directories, we arrived at a number of ways and means by which directory paper stock can be saved.

As a service to the industry in this common cause we have had these suggestions printed in pamphlet form and will be glad to mail a copy with our compliments to any telephone company desiring same.

WRITE FOR YOUR COPY TODAY!

L. M. Berry & Company

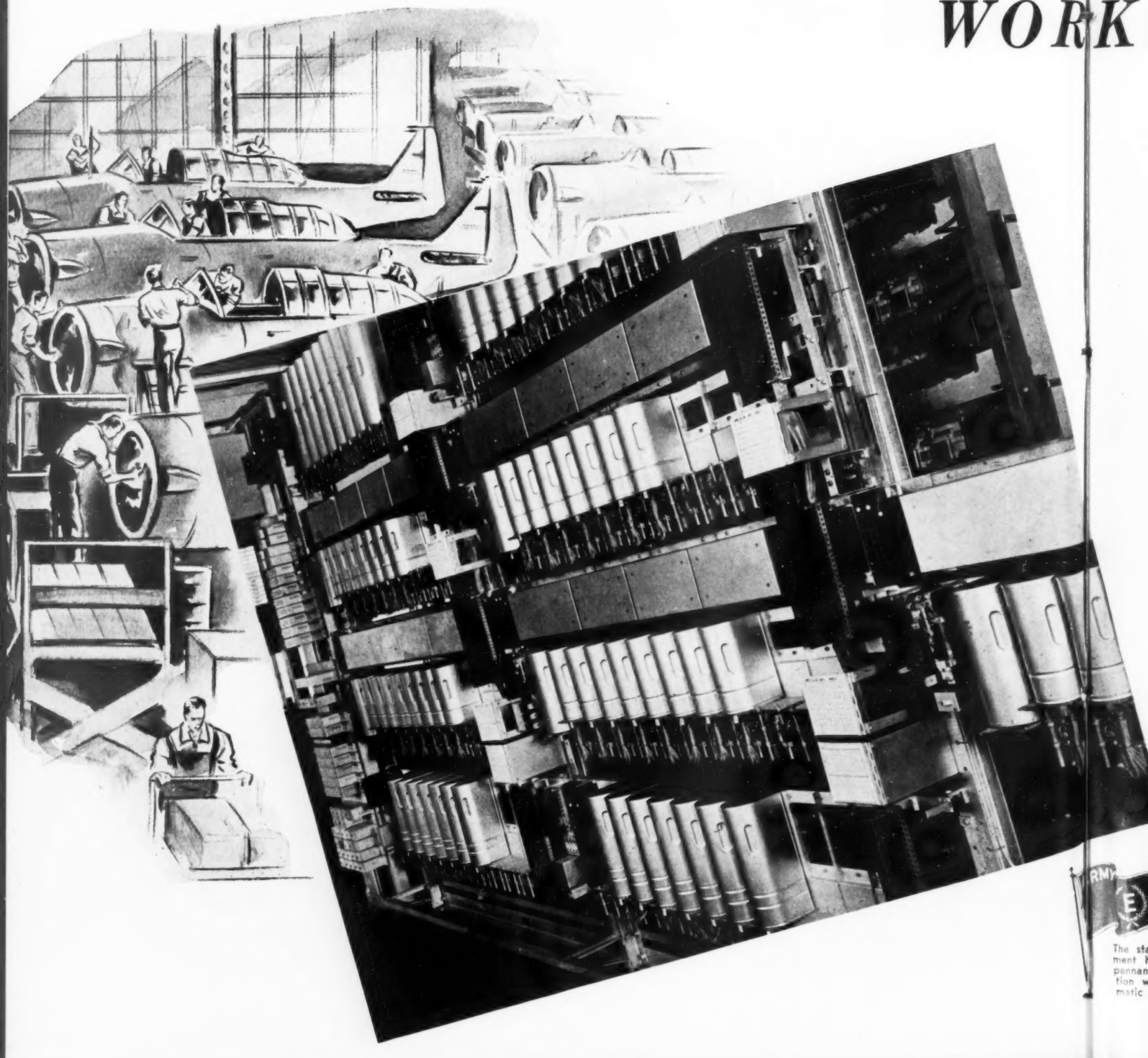
DAYTON, OHIO

Serving Telephone Companies in over 3,000 Cities and Towns

CANADIAN BRANCH: L. M. Berry & Co., Limited, WINNIPEG, CANADA

HERE'S THE '

WORK



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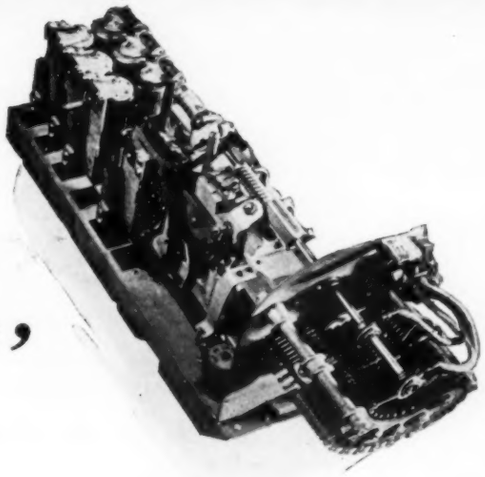

...E "FELLOW" WHO ...RKS THE 24-HOUR SHIFT!

Here's an untiring, never-resting worker. Built to function 24 hours a day, year after year, the Strowger switch is proving an invaluable aid to war-busy men. With unending snap and vigor, it handles call after call—swiftly and dependably.

All over the country, in telephone exchanges serving war production centers, training camps, and fighting bases, thousands of Strowger switches carry the vitally important messages in America's race for victory—saving the time of telephone users on all fronts, at home and abroad. Important, too, is the fact that they use least of that most vital of all wartime commodities—manpower and womanpower.

We at Automatic Electric will do our best to see that these switches never fail—nor, for that matter, that *any* telephone exchange will slacken or stop. That is why we urge you to call on us, regardless of the type of equipment you have, for any advice or suggestions or help that we can give to keep your exchange operating at peak efficiency under difficult wartime conditions.

The star for continued achievement has been added to this pennant for outstanding production which flies over the Automatic Electric plant.

AUTOMATIC ELECTRIC

ORIGINATORS AND DEVELOPERS OF STROWGER STEP-BY-STEP MACHINE SWITCHING AUTOMATIC DIAL SYSTEMS

MAKERS OF TELEPHONE, SIGNALING AND COMMUNICATION APPARATUS
ELECTRICAL ENGINEERS, DESIGNERS AND CONSULTANTS

Distributors in U. S. and Possessions:
AMERICAN AUTOMATIC ELECTRIC SALES COMPANY, Chicago, U.S.A.
Export Distributors: AUTOMATIC ELECTRIC SALES COMPANY, LIMITED

TOPS for RINGING SERVICE

SUB-CYCLE

Sub-Cycle is a powerful ringing converter built for heavy duty. It meets fully every requirement for the ideal ringing machine. There are no moving parts—nothing to adjust—no radio interference—is economical and quiet in operation. It can be depended upon to deliver years of trouble-free signaling service.

Made in 6 Models for loads from Small PBX to Large Central Office.

ALSO PULSATORS

Sold by Leading Distributors

THE LORAIN PRODUCTS CORPORATION
LORAIN, OHIO

For Quicker Longer Service

SYLVANIA TUNGSTEN TELEPHONE SWITCHBOARD LAMPS

ACTUAL SIZE

FASTER—Light up in one-fifth second.

BRIGHTER—Maximum end-on candle power. Sharper daylight signals.

STRONGER—Average life 1,500 hours of high brilliancy. Strong breakage resistant filament. Tight, correctly formed bases.

Available in: CLEAR
NATURAL RUBY*
NATURAL GREEN*

**While present supply lasts*

SYLVANIA
ELECTRIC PRODUCTS INC.
SALEM, MASS.
Formerly Hygrade Sylvania Corporation

Personalities

A. R. MacKinnon, executive secretary of the New York State Telephone Association, is planning a very worthwhile convention to be held by that association in Syracuse, N. Y. on May 26 and 27. After reading his Bulletin outlining the program we have made our reservation to attend and see if it can be as good as his "word picture."

●

James D. Farwell, 71, president of the Los Gatos (Calif.) Telephone Company, passed away last month at his home following a half century of service to his community. He was one of the organizers in 1911 of the Los Gatos Telephone Company and was prominent in banking circles. He had retired from active business in 1937.

●

M. C. Atkins, manager of the Bryan Tex., district of the Southwest Telephone Company, rounded out 32 years of active service the first of last month. He has a record of attendance seldom equalled as he has missed only four days because of illness during his 32 years tenure with the company. He is now president of the Bryan and Brazos County Chamber of Commerce.

●

Mr. and Mrs. E. F. Shipley have purchased the Timber (Ore.) Telephone Company from **John Shriner** of Portland, Ore. They are now operating the exchange.

●

Lt. Col. Carl A. Kraege, head of the McKrae Telephone Company, Burlington, Kan., while on leave from the Signal Corps during April announced the removal of the general offices of the company from Burlington to Fredonia, Kan. **Fred P. Marshall,** vice president and acting general manager, is moving the personnel and will also serve as local manager in place of **M. E. Howard,** resigned. While **Col. Kraege** is serving in the Signal Corps **Mr. Marshall** will push the modernization program already completed at Burlington.

●

Fred Cross has purchased the Ellis (Kan.) Telephone Company at Sheriffs sale. It was originally one of the **Nathan Jones** properties. **Harry S. Marx** will continue to serve as manager of the Ellis property.

Leich's Roy W. Siemond and A. C. Reid *(Right)*

A. C. Reid, president of Leich Electric Company, Genoa, Ill., and **Roy W. Siemund,** president of the Leich Sales Corporation, Chicago, were interested listeners at the recent Spring Executives Conference of the USITA in Chicago. Incidentally it was the first time we had been able to get them together for a picture. Here 'tis!

●

George Kloidy, secretary of the Nebraska association, carried this one in his May Bulletin. "I'm so relieved," reported the girl on the drill press. "I've just found out that those funny lumps on my arms are muscles."

●

Oscar Krick, manager of the Millstadt (Ill.) Telephone Company, is suffering severe injuries as a result of an assault by a subscriber following a dispute over a bill for telephone service.

●

William Wilde has sold his interest in the Mason (Ill.) Telephone Company to the Mason Mutual Telephone Company headed by president **Glen Ruffner. Mr. Wilde** will continue to operate the exchange at Edgewood, Ill.

C. B. Meshier, area manager for the Lincoln Tel. & Tel. Co., Tecumseh, Nebr., wrote himself into a deep-dish headache recently according to the Lincoln Telephone News. It appears that his correspondence to **Clyde Burge,** manager of the Beatrice, Nebr. exchange was mistakenly sent with the idea that **Mr. Burge** was a subscriber.

●

Frederick W. Bierwirth, vice president and telephone sales manager of the Western Electric Company, was elected a member of its board of directors at the annual meeting of its stockholders April 13. All other directors were re-elected and at the subsequent meeting of the new board all officers were re-elected.

●

Lt. Gen. Joseph W. Stilwell who endured the allied retreat from Burma, complained after one day in Washington that the telephone "is the worst thing ever invented."

That was the good natured comment from the commander of United States forces in the China-Burma-India war theater when the telephone rang in his hotel room during late April and interrupted snapping of a picture of his first meeting with **Mrs. Stilwell** in 15 months. The phone had been ringing continuously, he explained, since he arrived the day before.

●

I. H. Nakdimen, president of the Oklahoma-Arkansas Telephone Company, died during April at his Fort Smith, Ark., home. **Mr. Nakdimen** had been engaged in a 15-year-old controversy with the Bell System over the termination of his company's interstate long-distance toll connections by the Southwestern Bell. He came to this country from Russia as a boy and began a business career as a merchant in Oklahoma and Arkansas and during his lifetime controlled banks and newspapers in addition to the telephone property. He was 73 at his death which came from a sudden illness.

●

Manfred K. Toeppen, who has been in the FCC Engineering Department since 1935, was appointed April 28 to be Assistant Chief Engineer and Chief of the Common Carrier Division, succeeding Lt. Comdr. Gerald C. Gross now on active Navy duty who has held that acting post as the successor to Commander Andrew W. Cruse.

●

Sanford K. Trippet, president of the Princeton (Ind.) Telephone Company has been appointed to membership on the Indiana state teachers retirement fund board.

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CABLE GUARDS and STRAPS
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GUY WIRE PROTECTORS
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WASHERS (Round and Square)

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That's why so many telephone men "play it safe" and depend on L-M to hold their lines.

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YOUR QUESTIONS ANSWERED FREE

Line AND Desk

Q. Can you furnish information on the sharpening of climber gaffs?

A. We can do nothing better than to quote instructions on the sharpening of climber gaffs, originally furnished by courtesy of Mathias Klien and Sons and issued to every lineman in a large Middle-West telephone company.

1. Always use sharp file. NEVER grind to a point on any kind of wheel as you are likely to set up heat which will spoil the temper of the gaff and make it dangerous to use.

2. Set climber in a vise with the gaff uppermost and the stirrup of the climber turned down so that you can file from heel to point of gaff. File toward the point and down to the edges of the underside of the gaff. Remove only sufficient material to make a good point.

3. Do not make a needle point. File both side slopes, but not the top of gaff, to even rounded surfaces, so that the final point is always in the top ridge of the gaff.

4. The underside of the gaff should be left perfectly straight to within 1/16" of the point, then rounded slightly toward the top ridge of the gaff on a radius of ¼". At a distance 1/16" back from the point, you should have a width of approximately 3/32" on the underside of the gaff. The remainder of the underside should be kept perfectly straight.

5. For safety, climbers should not be used after the gaffs are worn or filed to 1¼" long, measured on the underside of the gaff. When climbers get in this condition, they should be regaffed or a new pair obtained. By following these simple instructions, a satisfactory job can be secured and no unnecessary risk will be taken.

Figure 1 illustrates the difference between an incorrectly sharpened climber gaff and a properly shaped gaff.

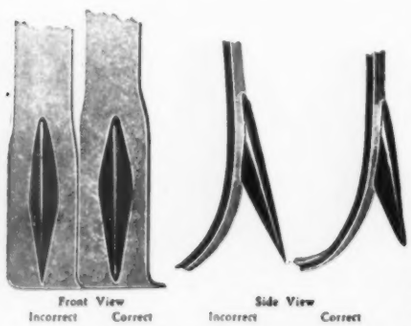


Fig. 1 — Correctly and incorrectly shaped climber gaffs.

Q. How does the rubber cushion used on switchboard cords prolong the life of these cords? What method is used to place the cushions on the cords?

A. Rubber cushions are employed on switchboard cords, just under the base of the plug, to reduce wear of the cord at the butt. Extensive field tests indicate that the cushion protects the cord in two definite ways: first, it reduces the undue bending of the cord at the butt which is the chief cause of the braid and the tinsel conductors wearing out at this point; and second, it absorbs the shock of the plug striking the plug seat when the cord is returned to its normal position. A special tool is utilized for placing the cushions on the cords. This device expands the rubber cushion and enables it to be easily slipped over the plug to the cord butt.

Q. We repair cable terminals in our shop and would like to know a good method of removing old compound from salvaged terminals.

A. A certain telephone company repair shop removes the face plates from the cable terminal and places several at one time in an oven heated to about 325° F. to melt off the compound. The face plates are put face up on a rack in the oven and the compound allowed to melt and run into a drip pan underneath the rack. What little compound remains on the face plates at the end of the heating period is washed off with a safe cleaning agent such as cleaner's solvent. The compound caught in the drip pan may be strained and reused later on in the repair process.

Q. What simple tool has been developed for opening a cable sleeve without damaging the sleeve?

A. Figure 2 shows an effective tool for opening cable sleeves. As will be noted in the illustration, this tool has a tongue and curved blade attached to a handle. The blade is shaped to fit over the beaten-down end of the sleeve and the tongue is designed to slip inside the sleeve for prying up the end. In use, the solder is first melted off the sleeve with a blow torch and all remaining solder is thoroughly wiped off, especially where the beaten-over end meets the cable sheath. The tongue of the tool is inserted in the crevice between the sleeve end and the sheath, and this end is pried up a little at a time as the tool is worked around the rim of the sleeve until it is opened up sufficiently to enable the sleeve to be slipped back to expose the cable splice. The other end of the sleeve is pried up only sufficiently to let the sleeve slide back. This tool does its work without damaging either the cable or the sleeve. Three sizes are shown in the illustration, the smallest designed for sleeves up to 1½ inches in diameter; the next larger, for up to 3½ inches in diameter; and the largest, for 4" or more in diameter.

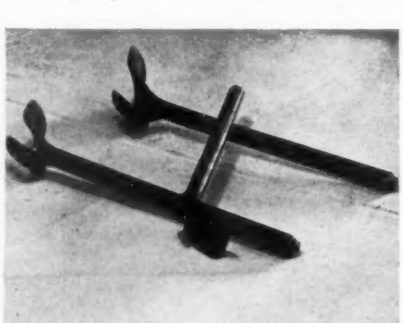


Fig. 2—Tools for opening cable sleeves.

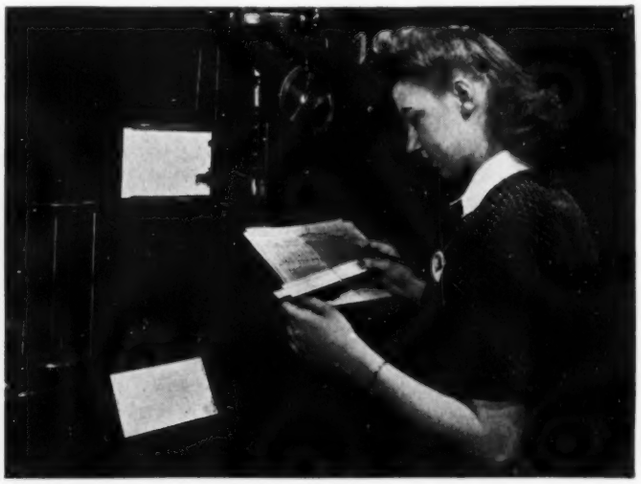
Questions Answered FREE

We welcome questions from every reader. If quick direct mail reply is needed please enclose stamped addressed envelope.

Womanpower meets war-time challenge

HANDLING FRENCH CURVES and compasses in the engineering office—or operating a heavy duty drill press in the plant—Western Electric women help to keep production flowing.

ELECTROPLATING used to be considered a man's job before the war—now girls are learning to be expert platers.



EXACTING SPECIFICATIONS to be met on war contracts? Girl inspectors test and check output with scrupulous care.

ADJUSTING RELAYS in central office equipment—and transporting reels of cable on a 15-ton crane—are jobs that women now handle with equal skill.

WOMANPOWER at Western Electric—nearly tripled since Pearl Harbor—is carrying on in splendid fashion for our 17,000 employees now serving in the armed forces.

Though women have long played a big part in making telephones, switchboards and cable, you'll find them today doing many kinds of work done in normal times by men only.

These feminine soldiers of production are doing a man-sized job—helping to meet record war-time needs for communications apparatus.

Western Electric

IN WAR . . . ARSENAL OF COMMUNICATIONS EQUIPMENT.
IN PEACE . . . SOURCE OF SUPPLY FOR THE BELL SYSTEM.

THE PIONEER'S CORNER

A national organization such as our Independent Pioneer Telephone Association is naturally composed of men of several age groups.

The older members on their records, by example and often by direct contact, provide the inspiration and encouragement so necessary to the younger men in the industry, who today even as the men of yesterday, are also pioneering and who face unafraid the unknown but certainly augumented and diversified problems to follow our Victory in this War, tomorrow.

Those Pioneers with long and bright service records have only had a longer period of opportunity to serve their neighbors with this so personal service. We honor them and rightly so, for their accomplishments and profit from their example.

Pioneering in the telephone industry starts for the individual on almost the first day he becomes connected with it. The requirement of ten and fifteen years service for membership in the Pioneers is only to assure that choice of occupation is permanent and absorption of ideals of service is certain.

In this group lies the greatest potential strength of the Pioneers. And many are not members only because they have not assumed their proper pride in their service to the industry or appreciated that they occupy an important present, though transient, place in the picture of American communication service.

It is this group of eligible Pioneers to whom the new recruits to the industry, many now operating Signal Corps equipment in all parts of the world and truly "pioneering" in communication service vital to our military effort, will look for guidance and advice.

I know of no intangible possession that can give more quiet pride and personal satisfaction than membership in the Independent Pioneers, evidence that one "belongs" to that army of men and women who serve their neighbors.

Cordially

F. G. Williamson,
Plant Superintendent
Northern Ohio Tel. Co.
Bellevue, Ohio

Named Vice President of Pennsylvania Association

C. E. Eaby, Denver & Ephrata (Penn.) Telephone Company, has been named vice president of the Pennsylvania Independent Telephone Association for the Eastern district. The vacancy was created by the death of the late Joseph F. Stockwell who had filled the post for many years.

'Miss Jones Speaking' Not 'Are Your Theah!'

Forty-three British girls are being Americanized in a little spot in England more rapidly than if they were almost any place in the United States.

They are clerks, telephonists, and orderlies—members of the WAAF (Women's Auxiliary Air Force) at the headquarters of the United States army air force bomber command.

On the telephone, instead of saying, "Sorry, the line's engaged," they now say, "The line is busy." Instead of the English "You're through", they report, "your party's on the line sir". And "drawing pins" have became thumb tacks.

It was quite a chore to address the WAAFs by their titles, such as "leading aircraft lady" or "flight sergeant." So the American officers and enlisted men adopted a simpler system. Most of them got better results by just saying, "Honey."

The girls like American Headquarters, where they are on fuller rations and where, through the post exchange, they get American candy, peanuts and cigarettes.

Ohio Unit Promotions

The promotion of a number of the commissioned officers with the 92nd Signal Battalion, sponsored by the Ohio Independent Telephone Association and now at Camp Maxey, Texas, has been announced.

Lieutenants Theodore Schweer, John Driver, and W. J. Melchers, have been promoted to Captaincies and given company commanderships.

Second Lieutenants D. B. Ewing and C. C. Stanton have been promoted to first lieutenantcies, and Lieutenant Wm. R. Gard, who recently completed a special course at the Adjutant General's School at Arlington, has been named as personnel adjutant for the unit.

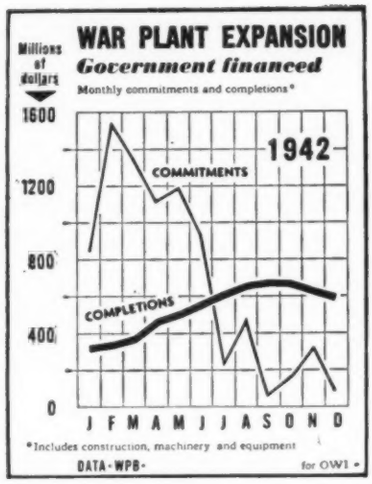
Captain W. F. Tucker, upon his return to the 92nd, following special training at Ft. Monmouth, has been designated as executive officer for the Battalion by Lieutenant Colonel Leonard J. McCann.

Captain Russell Johnson recently received his orders to report at Ft. Monmouth for advanced training.

Ancient Peruvian Phone Exhibited In New York

A primitive telephone, the earliest of its kind known, used by an ancient Indian ruler in Peru more than 1,000 years ago, is part of an exhibition in New York put on by the Official Commercial Agency of Peruvian Industries. The telephone consists of the necks of two gourds, one of each being covered with hide through which the end of a cotton cord about 150 feet long is inserted and knotted inside. When the string was stretched taut, the device served as a means of vocal communication.

"AND THIS ONE, I AM PROUD TO SAY, HAS GONE TO WAR"



Well, Why Not! Women Are Doing Men's Work

It created quite a stir among subscribers in Port Townsend, Wash., when the "voice with a smile" turned bass.

They had read about women leaving their normal occupations to become welders, riveters and machine operators in shipyards and war plants, but had this exodus become so serious that men were being hired as telephone operators to relieve the woman-power shortage?

But the Port Townsend residents have become accustomed to a deep "number, please" since it was explained that the U. S. Army is training some of its soldiers to operate switchboards of the type serving Port Townsend telephones.

Working alongside the regular women operators, the men are making actual telephone connections requested by subscribers. Miss Sonya Hansen, Port Townsend chief operator, and other expert operators are instructing and supervising the soldiers in operation of the switchboard.

About 12,000 telephone calls of all kinds are made in connection with the building of one four-motored bombing plane.

Commissioner Beamish Refuses To Leave Pennsylvania Post

Commissioner Richard J. Beamish, stormy petrel of the Pennsylvania Public Utilities Commission for the past ten years, refuses to budge from the post even though the state legislature enacted in law an amendment to the state utility act vacating his post. He comes down to his office daily and just sits at his desk although without any valid authority to continue in his commissionership. Mr. Beamish, who has been on both sides of the political fence in the Keystone state, threatens to test in the courts the new amendment and to remain at the commission until his successor is confirmed.

Carl Brorein Reelected By U. S. Chamber of Commerce

Carl D. Brorein, president of the Penninsular Telephone Co. of Tampa, Fla., was reelected vice president of the Chamber of Commerce of the United States at its meeting last fortnight in New York. Mr. Brorein, who headed the United States Independent Telephone Association in 1941, is now the second vice president of the Chamber of Commerce. He is also the president of the Florida State Chamber of Commerce. At the annual U. S. Chamber meeting he presided over the final session dealing with post-war problems.

Norton Celebrates 90th Birthday

W. A. Norton, president of the Kenton (Ohio) Telephone Co., observed his 90th birthday anniversary on December 18th. He went to his office building as usual. He served as treasurer of all local Masonic bodies for more than 50 years.

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Sorry, Soldier Telephone Rates Can't Be Changed

Because of its general interest the Federal Communications Commission April 15 made public its reply to the serious question of one American citizen. A lady in Ohio, on April 5, took time off to write to Washington, suggesting that telephone rates to members of the armed forces be reduced. Regretting that circumstances are not favorable to such a course, the Commission in its answer said:

"This matter has been under consideration by the Commission. While it has been generally agreed that reduced rates to members of the armed forces would be beneficial to the morale of the armed forces, representatives of the Bell System opposed such reduction for the reason that telephone facilities serving army camps were already overtaxed and the telephone company would be unable to secure additional equipment and personnel necessary to handle the increased traffic at lower rates, or properly to identify the person entitled to such rates. The Signal Corps of the United States Army also opposed reduced rates to members of the armed forces, because of the lack of plant facilities and the necessity of increasing its civilian and military personnel to handle the increased traffic, the responsibility of post signal officers in collecting toll charges, and the difficulty of identifying persons entitled to such rates.

"The increased burden on long-distance telephone facilities as the result of wartime demands has been a serious problem because of possible effects in delaying calls essential to the war effort."

It is pointed out however, that where the problems of time, facilities, and the identification of the user were more simple the Commission did facilitate low communications rates for the personnel of military services overseas. On May 27, 1942, the FCC announced special low rates of 60 cents per fixed-text message under "EFM" tariffs for cablegrams and radiograms filed by American companies operating international carriers.

James A. Schooler Passes

James A. Schooler, 64, owner and manager of the Bixby (Okla.) Telephone Company, passed away at his home the evening of April 22. He was a veteran telephoneman with a service record of 43 years having entered the business in 1900. His life's work was in the states of Missouri and Oklahoma. Mr. Schooler leaves his widow, Laura M. Schooler, who will continue to operate the exchange, and one daughter Mrs. Carl B. Adams, grand-daughter Carylnn Key Adams, Ponca City, Okla.

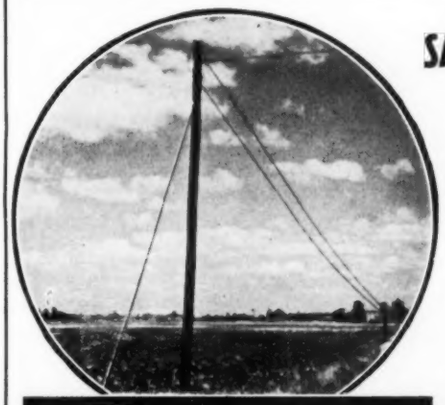
Tornado In Ohio

The principal damage to the telephone plant of the Ohio Bell Telephone Co. from the tornadoes which slashed through northeastern Ohio the evening of April 27 was the breaking of aerial cables in the local exchange plant and drop wires.

In South Cleveland about 1000 telephones were put out of service but were slated to be restored by the afternoon of April 30. In Akron there were 7500 stations out of service with complete restoration in sight by May 1. In the rural section around Norwalk, which is served by the Northern Ohio Telephone Co. the tornado cut a quarter-mile path over a 30-mile area and injured telephone service.

Then They Waxed Wroth

When Private Norman Bailey telephoned to headquarters at Camp Roberts in California to report arrival of a shipment of wax, the word spread quickly and officers started to do considerable sprucing up. Then came disappointment. They learned the shipment really was wax (for floor polish) and not WAACS. Private Bailey was due for some whacks.



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Longer, stronger spans, made possible by these high-strength wires, reduce the number of pole structures, conserve materials and save man-hours both in building and in maintenance.

Crapo HTL-85 permits spans of 225 feet in heavy loading districts; provides stronger, safer spans on existing lines.

Crapo HTL-135 makes practicable spans of 350 feet in heavy loading, 500 feet in light loading areas. Both are superior to standard B.B. wire in transmission qualities.

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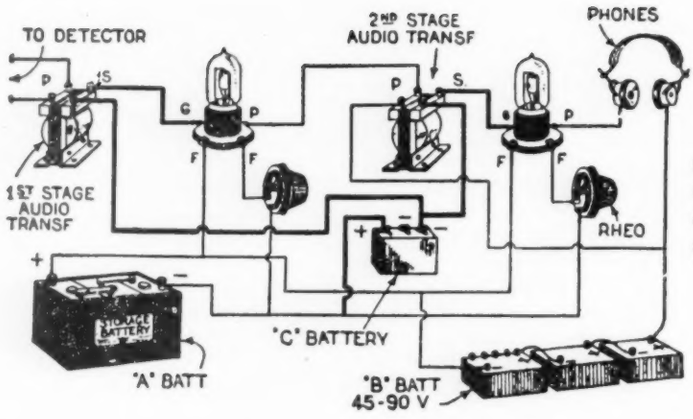

Fig. 13.—Pictorial type of circuit diagram.

Electrical Fundamentals For the Telephone Man

(Continued from page 27)

ally an electrical current will flow. The electricity which is generated is the result of the chemicals attacking the metal plates, thus releasing electrical energy. In order for current to be generated one or both of the plates **must be consumed or changed in character.**

In storage batteries the plates undergo a chemical change during discharge and then are restored to their original chemical composition by passing current through them in opposite directions which is known as recharging. In dry cells the zinc plate of the dry cell is gradually consumed and when the cell is dead or used up it cannot be recharged as can a storage battery.

Electromagnetic Methods

IT WAS long ago discovered that **whenever a wire was moved at right angles to a magnetic field it caused voltage to be created in the wire** and if the ends of the wire were connected together current could be drawn from the wire as long as it was moved through the magnetic field. Commercial power generators make use of this principle and are so arranged as to rotate a large number of wires in a powerful magnetic field, thus generating the electricity which is used to light our homes and operate our motors.

Thermo Electricity

ANOTHER method of generating current electricity, though not a practical one, involves the use of what is known as a **thermo-junction** consisting of two unlike metals which are welded together at one end and with the opposite ends free. When heat is applied in the welded junction a small voltage is generated and appears across the two free ends. If the circuit is closed current can be drawn from the junction. Two metals which are often used in a demonstration of this effect are copper and constantan. Figure 11 illustrates how this type of electricity is generated.

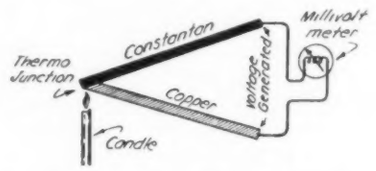

Fig. 11.—Generation of thermo-electricity.

Thermo electricity depends upon a difference in temperature between the free ends of a thermo junction and the ends that are in contact. Unless this difference in temperature exists electricity cannot be drawn from such a junction. The greater the temperature difference the greater the voltage generated. In a single junction the voltage generated is only a fraction of a volt and if an appreciable voltage is to be generated it is necessary to have a large number of junctions in series. Where several thermo junctions are connected in series, the combination is generally referred to as a thermo-pile.

Electrical Pyrometers

AS previously stated, thermo electricity has no practical significance from the standpoint of its use as a source of power.

The thermo electrical principle, however, is used in **electrical pyrometers** which consist essentially of a single thermo junction to which are connected a pair of wires which in turn connect to a sensitive direct current micro or milli-ammeter. The thermo pile is so arranged that it can be placed in ovens, melting pots, etc. for the measurement of high temperatures. The advantages of this type of temperature measuring device is its ability to measure extremely high temperatures such as those encountered in foundries; also its ability to permit the recording device to be located some distance from the furnace or point at which the measurement is taken and requiring only a pair of wires between the thermo-element and the meter.

Thermo-Electrical Meters

CERTAIN types of meters used primarily in radio work also make use of the thermo-electrical principle

IMPORTANT NOTICE

The diploma certificates on our Wire Chief's Training Course are now being mailed to all who completed the Course of 22 Lessons that ended in our February issue.

I am hoping that operating companies check their personnel and find out those taking these training courses furnished by TELEPHONE ENGINEER & MANAGEMENT. As announced on page 25 the course is entirely FREE to subscribers and if you have men now to the telephone business it would be of real value to them to have a subscription even at the company's expense.

Ray W. Smith, Editor.

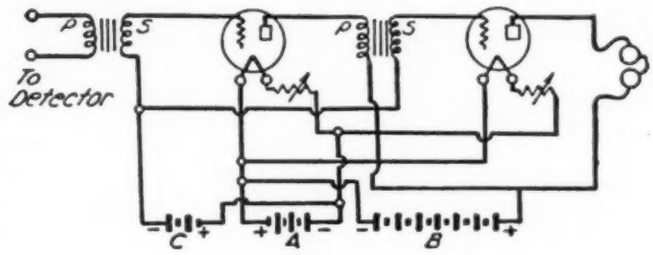

Fig. 14.—Schematic type of circuit diagram.

and are known as **thermo meters.** They consist of a thermo junction made up of two dissimilar metals, generally copper and constantan, and so arranged that the current to be measured flows through a resistance wire which is in contact with the thermo junction and this heat generates the voltage which actuates the D. C. milli or microammeter.

Such instruments are particularly useful in the measurement of radio frequency current as ordinary instruments cannot be used for this purpose due to the high frequencies involved. The basic circuit is shown in Fig. 12.

It has been found that if current is passed through a thermo-junction that the current will cause the junction to cool slightly. This is known as the **peltier** effect and has no practical appreciation.

Electrical and Radio Circuits

ANYONE interested in the study of electricity or radio must become familiar with **circuit diagrams** before they can hope to make much progress. In most present day books, electrical and radio apparatus is represented in circuit diagrams by means of symbols or schematic pictures which typify the type of device and method of connection in a circuit. Electrical circuits such as those showing house wiring and motor wiring are relatively simple except in the case of large buildings. Radio and telephone circuits, on the other hand, because of the large number of individual items in even a simple circuit and the many wires and connections, the circuit may become quite complex to those unfamiliar with reading circuit diagrams.

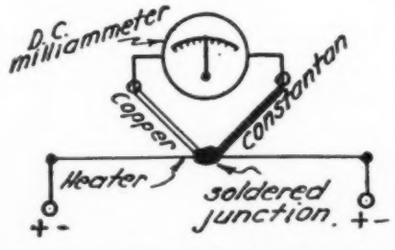

Fig. 12.—Basic circuit of a thermo electrical meter.

The first step in reading circuit diagrams is to become familiar with the various symbols. Next, one should actually wire up a circuit using the schematic type of diagram. It should be noted that there are two methods of showing the various connections in a radio circuit. One method sometimes used in magazines and which appeals to the general public but not to technicians is what is known as **pictorial diagrams.** Figure 13 shows a typical pictorial diagram.

Pictorial Diagrams

These diagrams show in picture form each piece of apparatus in an electrical circuit and its approximate location in the circuit and all connections.

AMERICAN
CREOSOTE WORKS
PINE POLES

For greater strength and outside plant economy, choose American Creosote Works' southern yellow pine poles.

Tests have proven that yellow pine poles are ***stronger.*** Pressure-treated with creosote, they are thoroughly preserved to assure long life. They stand up in storms, sleet, and high wind.

Fast shipment and quick service are assured.

Distributed By:

STROMBERG-CARLSON COMPANY

Factory & General Offices:
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SUB-CYCLE

A POWERFUL RINGING CONVERTER

Which Meets the Demands of Wartime

***Also PULSATORS**

Sub-Cycle is built for heavy duty and will stand up under the most severe operating conditions.

Sub-Cycle relieves maintenance men since there are NO MOVING PARTS TO ADJUST and it requires no routine maintenance.

Other features of Sub-Cycle:

- ★ Economical in operation.
- ★ Quiet.
- ★ Cannot interfere with radio reception.
- ★ Output voltage regulation between no load and full load is very close.
- ★ Manufactured in 6 models, for loads ranging from small PBX to the large central office.

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Branch Offices: Chicago, Kansas City, San Francisco, Toronto

From the standpoint of the layman who has no conception of or interest in electricity, these pictorial diagrams are somewhat preferable to the **schematic type** more commonly used as they enable the novice to wire up apparatus based on the appearance of the apparatus itself rather than some schematic or symbolic representation. Such pictorial diagrams are frowned on by technicians as they do not enable an accurate and clear visualization of the circuit function or theory as does the schematic type. It is recommended that all interested in electrical or radio theory endeavor to understand the schematic rather than the pictorial type of diagram. Figure 14 shows identically the some circuit as Figure 13 except in schematic form.

Radio and Electrical Symbols

EACH of the symbols shown in the following figures should be carefully studied and an attempt made to visualize the apparatus symbolically represented. Referring, for example, to the illustration showing the radio symbols. In the upper left hand corner of this illustration it will be observed that the first symbol is that for wires which are connected. Here the student should visualize two wires which are metallically connected together. The symbol directly below shows how wires are symbolically represented where they are not connected. This type of symbol is necessary so that circuit diagrams can be drawn with lines run in the most direct manner and yet so that the student is not confused by the fact that one line crosses over another.

The symbols for the various types of tubes may be quite confusing to the student, but again if one will actually look at each of the tubes symbolically shown and will study the theory of these tubes, the schematic picture then becomes much clearer than would an actual picture of the tube itself, as the relative position of the various elements of the tube are disclosed in the schematic but not in the pictorial view. It is apparent that the schematic form presents a much simpler picture and one which can be scrutinized from the standpoint of theory much easier than can be the pictorial illustrations. Electrical wiring symbols are shown in Fig. 16.

(To be continued)

EXAMINATIONS

Examination No. 1—Static and Current Electricity

1—Explain the difference between *static* and *current* electricity.

2—Describe the theory of the electroscope.

3—Name three methods of generating electricity.

4—Describe the principle of thermo electricity.

5—What is the *Peltier Effect?*

6—What are some of the applications of thermo-electricity?

7—What is meant by the term "electrostatic induction"?

8—Explain the difference between the schematic and pictorial type of circuit diagram.

9—Does lightning need to actually strike objects in order to create high voltages in the objects?

10—How is the thermo principle used in electrical meters?

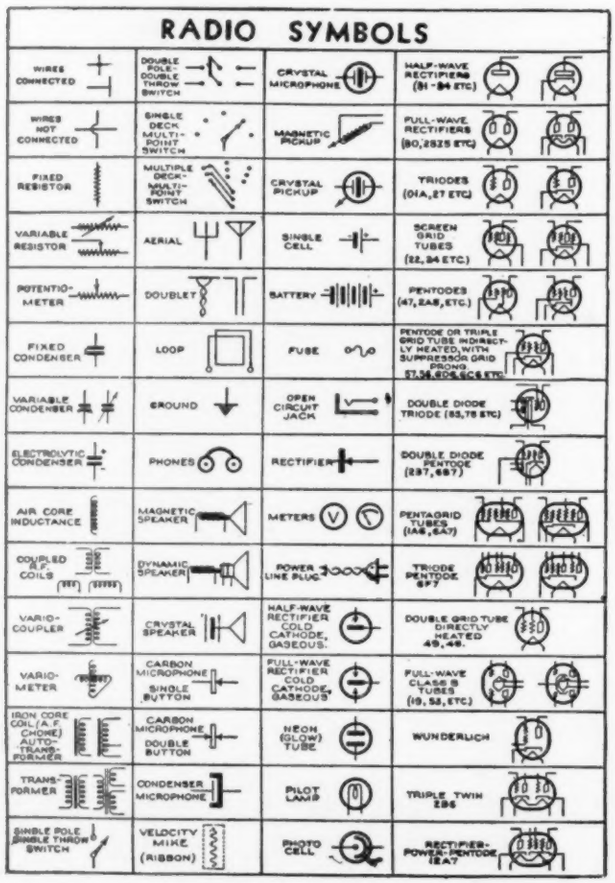


Fig. 15.—Radio symbols (Courtesy Radio News Magazine).

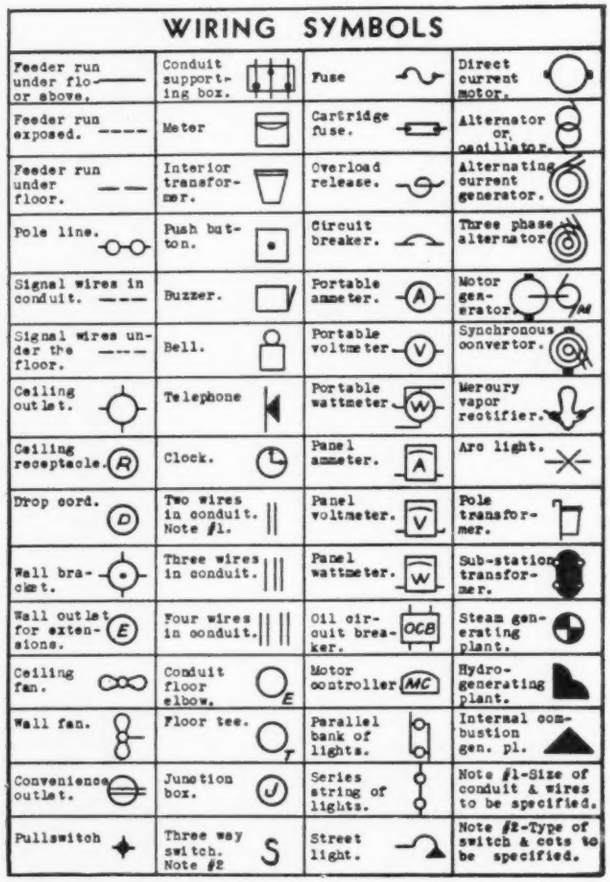
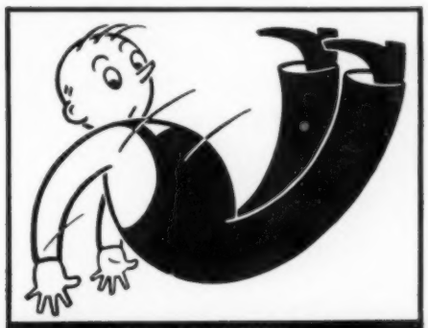
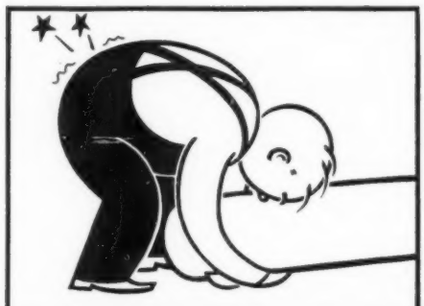


Fig. 16.—Electrical wiring symbols.

10 husky linemen

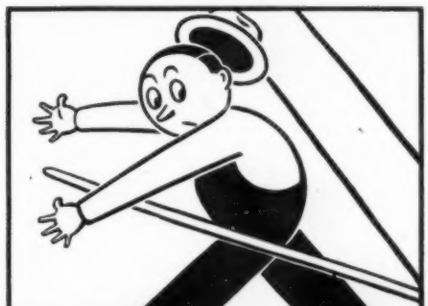


TEN HUSKY LINEMEN
RIDING DOWN THE LINE -
ONE TUMBLED OFF
THEN THERE WERE NINE.

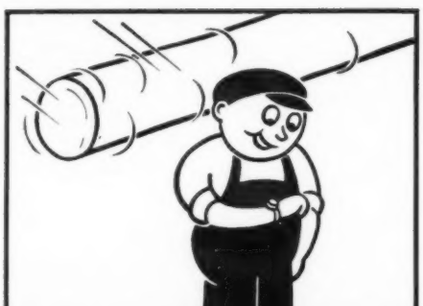


NINE HUSKY LINEMEN
LIFTING UP A WEIGHT -
ONE STRAINED HIS BACK.
THEN THERE WERE EIGHT

EIGHT HUSKY LINEMEN
CLIMBING UP TOWARD HEAVEN -
ONE CLIMBER SLIPPED.
THEN THERE WERE SEVEN.



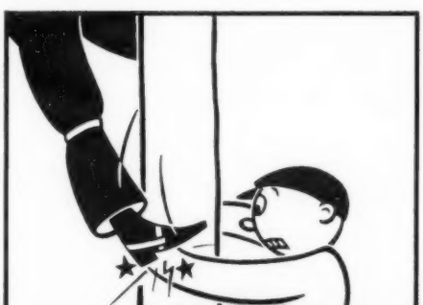
SEVEN HUSKY LINEMEN
SETTING UP SOME "STICKS" -
ONE MUFFED HIS PIKE POLE.
THEN THERE WERE SIX.



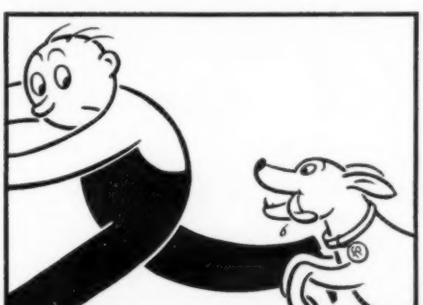
SIX HUSKY LINEMEN
UNLOAD AS POLES ARRIVE -
ONE STOPPED A "ROLLER"
THEN THERE WERE FIVE.

FIVE HUSKY LINEMEN
ON THE GROUND ONCE MORE -
ONE BLOCKED THE TRAFFIC.
THEN THERE WERE FOUR.

FOUR HUSKY LINEMEN
TRIMMING UP A TREE -
ONE TRIMMED THE HIGH LINE.
THEN THERE WERE THREE.



THREE HUSKY LINEMEN
HUSTLING TO GET THRU -
ONE GAFFED ANOTHER.
THEN THERE WERE TWO.



TWO HUSKY LINEMEN
GLAD THE JOB WAS DONE -
ONE ROUSED A DOG.
THEN THERE WAS ONE

ONE HUSKY LINEMAN
SAFE AT WORK AGAIN -
NEVER TAKES A CHANCE,
SMARTEST OF THE TEN!

Courtesy of The Pacific Telephone Magazine

DEVELOPMENT—DESIGN ELECTRO-ACOUSTICAL

Several communications engineers needed by progressive company in expanding engineering department.

TELEPHONE DEVELOPMENT

Graduate electrical engineer needed; good theoretical knowledge of acoustics desirable; some experience with magnetic circuits, acoustical measurements.

LABORATORY ENGINEER

For laboratory measurements and tests on a-f communications apparatus, a graduate electrical engineer. To design and supervise equipment for production testing; must maintain laboratory standards. Familiarity with government specifications and inspections procedure desirable.

COMMUNICATIONS—SIGNALING

Design engineer familiar with application and molding technique of plastics. Should have several years of design experience on small electrical apparatus; understanding of magnetic and electrical circuits desirable.

PERMANENT—POST-WAR

Positions concerned now with war contracts and planning post-war developments. Technically expert staff going places. Those now employed at highest skill in war industry need not apply. Communicate with Chief Engineer, giving background and salary requirements. Write, phone or wire.

GREAT AMERICAN INDUSTRIES, INC.

70 Britannia Street
Meriden, Connecticut

TRIPLETT *Combat Line*
TESTERS

TRIPLETT VOLT-OHM-MILLIAMMETER

Although some older designs are no longer obtainable, several alternate models are available to you under Government requirements.

TRIPLETT ELECTRICAL INSTRUMENT CO., BLUFFTON, OHIO

The Post War Telephone Plant

(Continued from page 32)

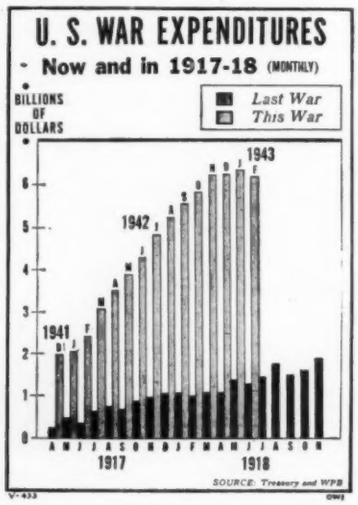
and then we know better.

Carrier systems have come into their own during the past 17 months as they have been the answer to the traffic man's prayer in getting extra circuits in a hurry and with a minimum expenditure of critical materials.

Present telephone carrier systems might properly be considered as **wired radio** as some of the frequencies employed extend into the range of frequencies also used for radio.

As everyone well knows, carrier systems are largely a Bell System product. They, of course, have had a real need for them. But in terms of speculative post-war telephone world, I think we too should be able to get practical carrier systems and at a cost that will enable us to handle wider use of the carrier principle.

Let's briefly look at the present day carrier picture. The simplest system is the type H suitable for use without amplifiers up to 200 miles. Next, we have the type C that gives three channels and it, of course, is a great deal more complicated and expensive than type H. They are used on transcontinental and other main cable leads and are seldom used on lines less than 150 miles in length. Then we jump to the type J system which uses frequencies as high as 142,000 cycles and which gives 12 carrier telephone channels from a single pair of wires. The counterpart of the J system is the **K** which also gives 12 channels but is primarily used for cable. These systems are used only on the longer toll circuits. They are both complicated and expensive.



Above and beyond these systems is the coaxial carrier systems which operate in a much higher frequency range and which are capable of as many as 256 channels from a single coaxial circuit. Two such coaxial systems are in use today carrying important traffic between cities. Others are proposed. It is circuits of this type that will carry the television programs of the future.

Now, where do we Independents fit into this carrier picture? I think in this way. There are many Independent companies that have need for and could use to advantage a simple single channel carrier system suitable for use on short haul toll circuits between towns. There are many companies operating with overloaded toll circuits to neighboring Independent exchanges. A single channel (inexpensive) carrier system that could be readily applied to an existing circuit would be a godsend in many cases.

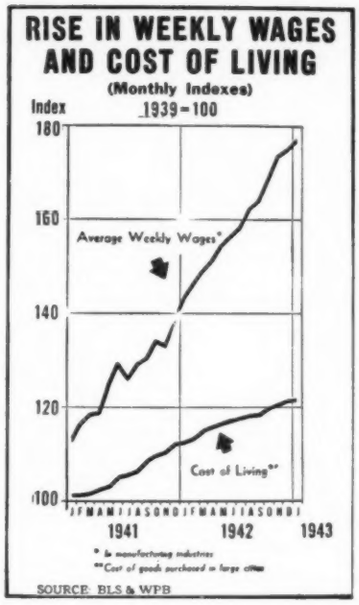
I think encouragement should be given to the manufacture of a simple one channel carrier system in the Independent field that would fit the need I have described. Possible this is another item for our Post-war Planning Committee to think about.

REA Carrier

YOU have all read from time to time in the past two years of the carrier telephone experiments being conducted by the REA. Several press reports have stated that REA have developed a new system that would soon provide regular party-line telephone service over their rural power lines. The real facts in connection with REA carrier telephone experiments are these:

The REA and the Bell System have for the past two years been carrying on development work to determine the technical possibilities of furnishing telephone service over REA rural power lines.

Much of the experimental work has been conducted on a section of REA line near LaPlata, Maryland. It was early discovered that the problem was not as simple as the press (and in some cases REA) would have us believe. It was found for example that the carrier currents encountered considerable loss in passing through power transformers and that special coupling arrangements were necessary to connect



the subscriber telephone sets to the transmission line. In other words, it wasn't simply a matter of plugging the connection of a special carrier type telephone into a wall socket. Coupling directly to the high voltage line imposed problems of protecting the equipment and users against the dangers of the high potential line as well as against lightning surges. But in spite of these difficulties, the Bell and REA did succeed in setting up a workable experimental layout consisting of two dial subscriber station units and terminal equipment at a dial central office. With this they were able to dial and talk to each other both through the central office and directly on the line.

The results were not entirely satisfactory due to line noise and other factors, but subsequent work in the laboratory resulted in new sets which corrected much of the trouble encountered. Further experiments have been held up until after the war.

I consider the possibility of farmers being served over rural power lines by a carrier telephone system as quite remote—not because of any serious technical considerations, but because of the terminal and station equipment cost as the result of the coupling problem.

Should the Government decide to subsidize the farmer's carrier telephone as they have his light and power requirements, the picture would be different. The danger, however, of suggesting that something can't or won't be done is exemplified by the following item carried by a New York paper in 1885:

> "Granting that a long-distance telephone will be forthcoming, it will require an absolutely perfect condition of the elements along the route over which the wire runs; there must be no rain, no fog, no sleet, nor mist; no moisture in the atmosphere, no electrical storms. . . . After all these difficulties have been overcome there still remains many reasons why it will not be a success . . .No Sir. . . . The coming long-distance telephone will be a plaything, nothing more. Put a mark on the assertion."

I understand that REA feel that if the carrier experiments turn out successfully, their interest will run to seeing that the farmer gets a phone and that they receive a small return for the use of their circuits.

I see nothing in the REA carrier telephone system to give us either immediate concern or future hope in connection with our rural plant problem. We should and will, of course, keep in close touch with future development work on the use of carriers on rural power systems.

Post-war Outside Plant

ALL of which brings us around to what most telephone men consider the down to earth end of the telephone business—the outside plant.

Although I expect no immediate revolutionary changes in outside plant, I do expect some inovations. I respectfully suggest that there are some plant developments that operating telephone companies may wish to foster and encourage. In connection with open plant, for example, I think that there are two possible changes to expect. One is the more extensive use of small gauge conductors. Improved metallurgical techniques have and will give us smaller gauge conductors which will have the same strength as conductors now considered standard. Much has already been done along this line —more will follow. The greatly increased strength possible using improved steels with standard size conductors can be utilized advantageously either by longer spans and consequent pole savings, or equally important, higher safety factors for rural and toll leads built over private property or along country roads that are impassable during bad weather. This latter suggestion is based on the proposition that we should in the future stress more than ever the need for reducing line maintenance costs. Plants located at a considerable distance from the office or along bad roads should be constructed, I believe, with a higher safety factor than plants readily accessible and close to the office.

Improved Wire Ties

A SUBJECT which I feel deserves unusually strong emphasis is the necessity for improved tying methods on

A DEPENDABLE
CABLE
TERMINAL

Reliable

Type RU unprotected terminals are easy to install, easy to work on and built to outlast the cable.

Upon request we will send a sample for your inspection without charge.

Reliable
ELECTRIC COMPANY
OVER 35 YEARS SERVICE TO THE UTILITIES
3145 CARROLL AVENUE · CHICAGO, ILLINOIS

Making

PARTNERS in PATIENCE

back home

• The pressure of war can lead to taut nerves. But good nature gets more done than bad temper. So the advertisement on the opposite page (appearing in national magazines during May and June) was designed to show the need for continued friendly co-operation between telephone employees and customers. We hope it will benefit the entire industry.

An advertisement of the BELL TELEPHONE SYSTEM

He can smile through it all

So let's keep a smile a-going back here, too.

Even though war is crowding the wires, telephone people still want to give you pleasant, friendly service. Materials for new telephone facilities are not to be had. But there's no shortage of patience and understanding.

Takes a lot of pulling together to do this and we appreciate the help from your end of the line.

BELL TELEPHONE SYSTEM

WAR CALLS COME FIRST

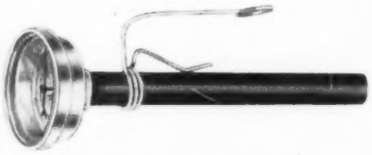
• Your continued help in making only vital calls to war-busy centers is more and more essential every day.

PROOF!

ACTUAL LABORATORY TESTS SHOW THAT THE "PAPER" METHOD OF OBTAINING METAL TEMPERATURE GIVES HIGHLY VARIABLE RESULTS

LAB-REPORT

"In the test, pieces of paper were inserted in molten solder. Simulating actual field conditions, the thickness and characteristics of the papers varied. Some were newspaper, some wrapping paper, still others light cardboard. These all turned brown at different temperatures. Error was further increased by unbiased observers who disagreed on exact shade of brown in test papers.



EXACT TEMPERATURE

Dillon Temperometer *always* reads the same. No chance for error. Instantaneous. Handy. Priced low to make the job right!

W. C. DILLON & CO. INC. 5410 W. HARRISON STREET CHICAGO, ILLINOIS

WEAR A

BUDDY POPPY

on

MEMORIAL DAY

- "Buddy Poppies" made by disabled war veterans in government hospitals are a recognized symbol of American patriotism.
- They are sold to aid needy veterans, servicemen and their dependents. A portion of the proceeds will also be allotted to the Veterans of Foreign Wars National Home for Widows and Orphans of Ex-Service Men.

SATURDAY, MAY 29

BUDDY POPPY DAY

VETERANS OF FOREIGN WARS OF THE U.S.

open wire lines. Much experimental work has been done in recent years on open wire ties for steel, copper, and copperweld conductors to determine the cause of the many wire breaks that occur during storm conditions. Laboratories have set up elaborate equipment and have oscillated for millions of cycles actual wire spans. By means of the stroboscope, the vibrations at the tie were slowed down so that the action could be visually observed. They have been able to learn much about wire breaks not heretofore known. These investigations show that the chief cause of wire breaks has been a combination of **chafing** and **fatigue** in the line wire at the tie.

The standard ties that have been recommended for copper and iron wire for the past 10 or 15 years have, when properly installed, proved fairly satisfactory. However, the laboratory tests have shown that unless these ties are perfectly applied, they will eventually cause trouble.

The thousands of wire breaks that show up after a major sleet storm almost always occur at weakened spots in the line wire at or near the point of support. It has been found that the remedy is to remove the personal equation from open wire tying by the use of what might be termed **the armor or reinforcing tie.** This is nothing more or less than an auxilliary protective tie wire covering that is applied to the line wire for several inches near the point of support. It may consist of either a length of tie wire wrapped tightly around the line wire, or some type of preformed tie that snaps on the line wire. The line wire is then held snugly against the insulator by either the conventional or some other tying method which, even though not applied skillfully, will correct the wear that so often takes place at the tie. The armor tie also serves to damp out the high frequency line wire vibrations that cause line wire fatigue and which are a source of line breaks.

Any plant executive who will weigh the cost of restoring hundreds of line wire breaks after a severe storm against the added cost of the special tying precautions, cannot help but come to the conclusion that here is a method worthy of immediate adoption, as it will reduce the annual charges on open wire. There will undoubtedly be a large amount of wire replacement work in the post-war period. I suggest you investigate the new wire tying procedures without delay. I cannot over emphasize the importance of this.

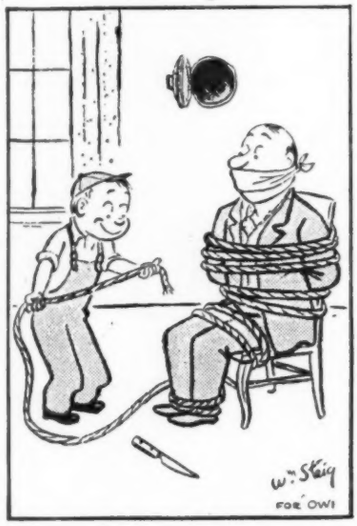
Drop Wire Changes

I ANTICIPATE that we may see some changes in our drop wire specifications. For some years we have become accustomed to No. 17 B & S drop wire which had a breaking strength of approximately 170 pounds. Recently you may have observed that some of the larger companies have swung over to No. 18. But even though 11% smaller in size by use of higher strength steel, the breaking strength of No. 18 is still approximately 170 pounds.

I understand that with new techniques in handling steel it is now feasible to make drop wire with a No. 20 B & S conductor, which would still have about the same strength as the old No. 17 which has served us so faithfully for many years, yet No. 20 is only one-half the size of No. 17. Here again we could have a choice of specifying No. 17 wire with high tensile strength steel with a breaking strength far greater than that of the old product, or we could specify the smaller gauge conductor with a breaking strength which past experience has shown as inadequate, yet which because it would be only one-half as heavy it should be easier to handle and somewhat cheaper. I think we might well choose the smaller gauge wire. There should be cost advantages to the Industry as a whole if a standard size drop wire is used.

I understand that development work is going on in connection with a new drop wire which will be enclosed in a self-supporting lead sheath. I have no details on this and off-hand am inclined to be a little skeptical. Knowing what happens to lead sheath in contact with tree limbs, I can see no relief in a lead covered aerial drop wire. The short life of drop wire warrants, however, special consideration being given to the development of an improved product that will increase the longevity of this most perishable plant item, or the use of buried drops.

Kid Salvage



Buried Cable and Drop Wire

BURIED cable, like a blend, is always attractive to a telephone man. After a sleet storm has laid everything flat, the first thought that comes to the plant man is "Why don't I bury the damn stuff."

Admittedly, buried cable has many attractive features. However, for town distribution plant it has always been subject to the objection that it lacks flexibility. If you could bury all of the plant, it would have merit. If, as is usually the case, you have to come up into the air at least once or twice within the block, it is hardly worth the chips. Hence, most of us at one time or another have looked hopefully at buried cable then passed it up.

I think that possibly we have not looked far enough, and that we have tried to adopt existing tools to buried plant instead of starting from scratch. I am sure that there is a real field for a complete buried cable and drop wire plant in both small and large exchanges. Buried plant would be particularly attractive in those small plants that are remote from maintenance headquarters.

As I visualize our buried cable plant of the future, it will consist of the standard jute covered cable laid in a narrow two inch slit trench from 24 to 30 inches deep. The trench would be cut by a simple inexpensive machine digger built along the same lines as the small two wheel garden tractors and capable of working in close quarters and close to lot lines. This same machine would be used to cut the narrow trench for burying the drop in the run between hand-hole and house. The drop wire would be either the standard buried wire or a jute covered one pair lead covered cable.

Terminations would be provided at two or more locations in a block and would consist of a simple pre-cast round concrete hand-hole (similar to a 12" diameter drain tile) with a slit in each side for the cable and drop wires to pass through. Either a concrete or light cast iron cover would be used. The U. G. watertight cable terminal would serve as a splicing chamber thus eliminating the need for a sleeve. Splicing would be done above ground. The terminal would bolt to two steel straps imbedded in the concrete. The whole assembly would be small and inexpensive. The cable would be graded up at the hand-hole locations so that only a shallow concrete frame similar to but much shorter than a large sewer tile would be needed.

When for one reason or another underground drop distribution would not be feasible in a specific location, a drop pole could be set along side the hand-hole and the buried wire carried up the pole with a protector at the pole top. Wood molding would protect the run up the pole.

I feel certain that our progress in the use of buried cable and drop wire on the basis outlined will depend on what we "dream up" in the way of a simple and nominally priced ground slitter. Considering the typical Yankee ingenuity displayed by our Independent manufacturers in the past, I do not feel this would be such a heroic job. Why not also put this item on the Agenda of the Post-war Planning Committee?

Praise To Telephone Operators

Frances Troy Northcross, a columnist who writes for the Washington Times-Herald, recently paid tribute to telephone operators everywhere.

"I want to say that of all the people in the world, the telephone girl has it all over every other public servant for patience, sweetness, evenness of temper, and universal courtesy. Ladies and gentlemen, that hardworking girl is ever at your service, through weather that scorches or freezes, through disaster and panic; she stands ready to serve you with a smile in her voice, and a willingness in her heart. All praise to her."

Cable

THE war and the necessity for saving critical materials has focused attention on the availibility and use of small gauge cable and wire. Comparison of the weights involved in a mile of 26 pair cable in the several gauges is interesting:

Gauge	Diameter in Inches	Copper Wt. per Mile (lbs.)	Resistance per cct. Mile
28	.0126	133	700w
26	.0159	212	440w
24	.0201	336	274w
22	.0254	535	171w
19	.0359	1070	85w

Table No. 1—Comparison of Cable Gauges (26 pair size—length one mile)

Most of the larger Independent telephone companies have for some time been taking advantage of the economy in cable plant construction that accrues to the smaller gauge cables, particularly 24 and 26.

Few Independents have had experience with 28 gauge cable. It was developed before the war but its use has been recently encouraged as a means of saving copper. It has well defined signalling and transmission limitations, yet there are some that think that it (like Roosevelt) is here to stay. It is suggested that after the war it may find use in many applications such as house and block cable in the larger exchanges, and for small town cable plants when the longest loop is seldom over a few thousand feet from the central office.

The splicing costs of 28 gauge cable will undoubtedly be higher than for the larger gauges. The splicers grumbled when 24 gauge was introduced. They raised H—— when 24 was put on the market. What will they say when we ask them to splice a conductor not much thicker than a hair?

Because of its high resistance and transmission loss, 28 gauge cable must be used with discretion. It is not anticipated its life will be materially different than 24 or 26 gauge. It incidently has a loss of 3.5 db per mile as compared to 2.7db for 26 gauge and its resistance is 700w per mile.

As I see it we should regard it as a plant item that may prove helpful in reducing our plant investment in the smaller towns.

Need for Standardized Practices

DURING the three months I spent analyzing telephone construction projects at the Communications Division of the War Production Board, I was impressed by the wide variety of plant construction practices used by Independent telephone companies. I was particularly surprised that many Independent companies are still proposing the use of 22 gauge exchange cable even though 24 or 26 gauge cable would have provided ample transmission and signalling margins in the locations for which the cables were proposed.

It would seem that telephone plant

LAST YEAR'S BONDS GOT US STARTED

THIS YEAR'S BONDS

ARE TO WIN!

★ Last year saw nearly 30,000,000 workers voluntarily buying War Bonds through some 175,000 Pay-Roll Savings Plans. And buying these War Bonds at an average rate of practically 10% of their gross pay!

This year we've got to top *all* these figures—and top them handsomely! For the swiftly accelerated purchase of War Bonds is one of the greatest services we can render to our country . . . and to our own sons . . . and our neighbors' sons. Through the mounting purchase of War Bonds we forge a more potent weapon of victory, and build stronger bulwarks for the preservation of the American way of life.

"But there's a Pay-Roll Savings Plan already running in my plant."

Sure, there is—but how long is it since *you've* done anything about it? These plans won't run without winding, any more than your watch! Check up on it today. If it doesn't show substantially more than 10% of your plant's pay-roll going into War Bonds, it needs winding!

And you're the man to wind it! Organize a vigorous drive. In just 6 days, a large airplane manufacturer increased his plant's showing from 35% of employees and 2½% of pay-roll, to 98% of employees and 12% of pay-roll. A large West Coast shipyard keeps participation jacked up to 14% of pay-roll! You can do as well, or better.

By so doing, you help your nation, you help your workers, and you also help yourself. In plant after plant, the successful working out of a Pay-Roll Savings Plan has given labor and management a common interest and a common goal. Company spirit soars. Minor misunderstandings and disputes head downward, and production swings up.

War Bonds will help us win the war, and help close the inflationary gap. And they won't stop working when victory comes! On the contrary—they will furnish a reservoir of purchasing power to help American business re-establish itself in the markets of peace. *Remember, the bond charts of today are the sales curves of tomorrow!*

You've done your bit Now do your best!

THIS SPACE IS A CONTRIBUTION TO AMERICA'S ALL-OUT WAR EFFORT BY

TELEPHONE ENGINEER & MANAGEMENT

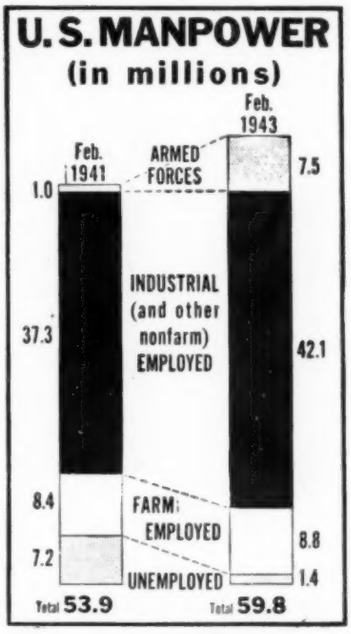
investment, particularly in the smaller towns, is amply high without the necessity for using more copper and lead than is needed.

The same situation exists in connection with inside wire. Many Independent companies were sending in preference rating applications to obtain, among other things, No. 19 gauge inside wire for station installation work. The larger companies, both Bell and Independents, have for some time been taking advantage of the economy offered by 22 gauge inside wire, which incidently requires only one-half the copper required by No. 19, and being smaller presents a better appearance.

The purpose of my reciting these typical examples is to point out the need for more uniform plant practices in the Independent field.

We cannot hope nor do we desire to emulate the Bell System and have everything as "alike as peas in a pod" in our 6812 exchanges, but we certainly should do something toward getting our companies to adopt plant practices that offer substantial advantages. The smaller the number of wire sizes a manufacturer is called on to produce the lower the unit cost of the finished product.

I am not unmindful of the fact that our larger operating groups and companies are certainly not overlooking any bets or lack appreciation of what constitutes good plant practices. But I do think that many of the smaller single unit companies, who are not able to have their ear to the ground as closely as our larger groups, need some authentic working manual which they can use as a guide. I suggest that our $739,000,000 investment in telephone plant deserves its fair share of consideration in post-war planning.



Should we not have some specifications or working standards for plant construction which will bring about more uniform and economical telephone plant particularly in the case of the hundreds of small Independent plants which have been operating on a trial and error basis with regard to plant practices, or should we continue to pass information down from father to son or Joe to Dick with the fate of each particular plant dependent on the knowledge and likes or dislikes of the current manager. The ice, petroleum, lumber and many other industries have working standards. What do we have?

Let's Write Our Own Prescription

IT IS a characteristic of the telephone industry to be very stable and more or less static. This is fine but I don't believe we should overdo it. I think it is time, at least in connection with plant, that we begin to think about what we need to do our job better and at less cost. The day of the basic inventor has passed. Whereas we formerly had inventions we now have developments. We know what our plant problems are. Let's set about solving them by coordinating

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the various tools and material at our disposal. Let's not wait for the Bell System or anyone else to answer our problems for us. We should, of course, be alert to what they are doing and should not hesitate to adopt any practice that fits our requirements. We should standardize our plant but not our thinking.

I well appreciate the need for standardization (in fact I specifically recommend it), but I think we should be careful to avoid freezing our thinking in terms of our old established practices. At the very least we should drag out those practices periodically and examine them to make sure there are not better ways to accomplish the same end.

Just for fun, take your favorite supply catalog and go through it item by item and ask yourself if there is any better way of doing a certain thing such as supporting a wire, terminating cable pairs, etc. For example, take such simple items as a wood bracket farm line. For 20 years or more we have been attaching wood brackets with one 60 and one 30 penny nail. We then screw on a glass insulator. We have several items and and several operations. Could not an improved porcelain insulator be developed which we could attach with a single medium size nail or screw and which would give adequately good results without any bracket to rot out, with no possibility of floating insulators, with no pole tops to split because of 60 penny nails and with a saving in both first cost and maintenance expenses? Some may say that we would be unable to get adequate insulation with such an arrangement. This would be a consideration but not one that should give the development engineer serious trouble.

Telephone Transportation

IN THE matter of transportation it would seem that we have an opportunity to do some original thinking—possibly borrow some ideas from the Army Jeep. Telephone maintenance men must be on the road in all kinds of weather. In fact when the weather is bad and the roads impassable for ordinary vehicles the telephone repairman is most generally out on the line restoring service which has been interrupted by bad weather conditions. Our job is an all-weather job.

We need an all-weather and all purpose car. It should not be a heroic job to engineer a light hole auger and a pole boom for an Army Jeep type maintenance car capable of going anywhere at any time. We might take up where the Army left off.

I mentioned my idea of a light weight —low cost hole digger to a friend of mine the other day and he said, "Why, a digger and truck cost around $4,000; a small company can't afford that kind of a vehicle." Of course they can't, but they could afford $200 or $300 for a simple digger capable of digging holes suitable for the average small exchange and that could be mounted on a light maintenance truck. No need of having a digger capable of digging a 9-foot hole for a class 1 pole if your average need is for a 3-foot hole for a class 7 pole.

Recently a telephone man over in Charlie Deering's state "cooked up" a home-made digger that cost less than a $100 and digs a 4-foot hole in 2 or 3 minutes. If they can do it over in Iowa, they can do it elsewhere. But we've got to ask for it. Let's let the manufacturers know what we need.

Conclusion

WE ARE facing an uncertain and unusual future. It may well be an age in which technological developments will be so far reaching as to upset and disturb our normally calm existence. If this be true, let's participate in these new developments. Let's stake out our claims otherwise we may some day be sharing our responsibility for transmitting voice communication with another industry or, God help us, with some agency of the Government.

We must not stick our heads in the sand and ignore innovations such as television, facsimile video attachments for the telephone, ultra-short wave radio, and the host of other electronic developments that might well revolutionize our way of life. Let's be ready to move into this technical "Shangri-La," if, and when it comes.

(END)

Navy Father, Two Sons Meet At Pay Station

A telephone attendant in the public telephone section of a New York railroad station thought it odd that a nearby attendant was putting through a long distance call to the same little southern town she herself was calling for a Navy man.

So, asking a few questions, she discovered that her Navy customer was the son of a man putting through a call in another booth. Both were in the Navy, both were on a week-end leave, and both were calling home. A third sailor who was with the father was his other son.

The three men joyfully closed ranks, put through one big call and told the folks at home it was a small world.

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Telephone Engineer
HANDBOOK TABLES

Subject: Underground Cable Construction Units

Index—Cable Data
Date—May 15, 1943

General

(Continued)

The following table gives typical construction costs for underground cable construction. These are for average conditions in one section of the country.

Item	Material Cost Per Foot	Hours Per 400 Feet L	Labor Cost Per Ft.	Unit Cost Per Ft.
100 pr. 24 ga. cable	.20	8.	.07	.27
150 " 24 " "	.28	9.	.09	.37
200 " 24 " "	.35	9.	.09	.44
300 " 24 " "	.48	10.	.11	.59
400 " 24 " "	.64	10.	.12	.76
600 " 24 " "	.96	12.	.15	1.11
900 " 24 " "	1.38	12.	.18	1.56
1200 " 24 " "	1.84	15.	.26	2.10
25 " 26 " "	.07	6.	.05	.12
50 " 26 " "	.11	7.	.06	.17
100 " 26 " "	.17	8.	.07	.24
150 " 26 " "	.22	9.	.09	.31
200 " 26 " "	.28	9.	.09	.37
300 " 26 " "	.39	10.	.11	.50
400 " 26 " "	.50	10.	.12	.62
600 " 26 " "	.76	12.	.15	.91
900 " 26 " "	1.08	12.	.18	1.26
1200 " 26 " "	1.41	15.	.26	1.67
1800 " 26 " "	2.11	18.	.35	2.46

U. S. GUNS ROAR FOR COPPER SCRAP!

WILL THEY BE SILENCED BECAUSE YOU LET THEM DOWN?

WHO said that the Army and Navy have enough copper, brass and bronze? He's talking through his hat!

Listen to the War Production Board: "The supply of copper is not adequate and never will be while this war is on . . . needs are so large that they cannot possibly be met . . . copper, brass and bronze scrap is the No. 1 industrial salvage problem of 1943!" Scrap is the source of approximately 40% of America's copper.

Demand Going Up!

Sure, copper has been banned from thousands of civilian products. The armed forces cut their requirements to the bone. Scores of substitutes have been introduced. Still Industry is called on to produce 62½% more copper, brass and bronze scrap this year than in 1942. But needs multiply daily. Copper for wires and cables on ships planes and tanks. Brass for shell casings. Bronze for gears and bearings for vital machinery. And in the face of these needs, *America's copper refineries are operating at less than 1/5 of capacity.*

Maybe right now guns are silent that ought to be firing . . . furnaces cold that ought to be going full blast . . . because *you* didn't move *your* copper, brass and bronze scrap, when the call first went out.

Scrap or Human Life — Which?

Right now the war is going into the offensive stage. The demand for scrap—*all kinds of scrap*—is going to be terrific. The lack will have to be made up in the lives of fine American youth. You can't keep putting it off. Not while there's an ounce of useless, dormant iron and steel, copper, brass or bronze . . . in or around your plant. Not while our steel mills alone need 13,000,000 tons of purchased scrap in the first half of 1943 to keep charging their furnaces! *Not when the lives of thousands of brave men hang in the balance!*

WHAT IS DORMANT SCRAP?

Obsolete machinery, tools, equipment, dies, jigs, fixtures, etc., which are incapable of current or immediate future use in the war production effort because they are broken, worn out, irreparable, dismantled or in need of unavailable parts necessary to practical re-employment.

FOLLOW THIS RULE

If it hasn't been used for three months, and if someone can't prove that it's going to be used in the next three — sell it* — or scrap it!
***Scrap and used equipment dealers pay well for usable machinery and materials.**

Tried Once? . . . Try Again!

Nobody ever makes a clean sweep the first time around the plant. Not even the second . . . or the third. Scrap collecting is a year-round job!

Put a Grade-A Scrapper at the head of your Salvage Committee . . . somebody with real authority. Tell him to go ahead, damn the torpedoes, and no holds barred!

Sell All Unused Machinery and Equipment

Don't stop with the junk. There's plenty of valuable iron and steel tied up in machinery and equipment that can't be had any more. Sell it . . . *somebody* wants it. If it's usable, you'll get prices far better than would be paid for it as scrap. And production somewhere else may be held up because that very equipment is missing!

How To Sell Your Scrap

If you have no regular scrap dealer, find one in the classified phone book. He'll buy usable materials, too; or you can find a Used Equipment Dealer in the same place.

Don't expect your scrap heap to be a gold mine—the dealer works under a price ceiling, the same as you do. But you will find there's a million dollar feeling in the knowledge that you're doing your part all the way. It's 100% better than the guilty sensation you get every time you pass some good metal you should have scrapped months ago!

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If you have done a successful salvage job at your plant, send details and pictures to this magazine.

SEND FOR PRIMER OF INDUSTRIAL SCRAP TO HELP YOU TACKLE THE SALVAGE PROBLEM

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Admiral Hooper Joins Staff of Automatic Electric Company

Rear Admiral Stanford Caldwell Hooper, USN (Ret.)

REAR Admiral Stanford Caldwell Hooper, USN (Ret.), a leading figure in the fields of Naval and international radio communication is establishing an office in New York where he will carry on business as a consultant for a limited number of firms to whom his technical knowledge and experience will be of value. Automatic Electric Company, Chicago, will be one of his clients.

Admiral Hooper retired on March 15 from active service in the United States Navy, completing a distinguished career which has included leading posts in Naval radio and communication engineering and administration. Since June, 1942, and until his recent retirement from the Navy, he held the post of General Consultant for Radio, Radar and Underwater Sound Equipment for the Navy.

Admiral Hooper graduated from the United States Naval Academy in 1905. Commissioned as Ensign, he steadily advanced through the grades, being appointed Rear Admiral in 1938. His contributions to radio science and its applications to Naval uses dates back to well before World War I. In 1912 as First United States Fleet Radio Officer and later as head of the Radio Division of the Navy Department, he was instrumental in perfecting radio communication for the Navy, placing it on such a firm footing that the United States became recognized for its leadership in this field.

As an accepted world authority in radio and communication engineering and kindred subjects, Admiral Hooper brings to Automatic Electric Company an intimate knowledge of technical and practical communication problems which should prove of great value in furthering the work in which the company is engaged, particularly in its relation to steadily expanding government requirements.

Automatic Electric Company is internationally known for its engineering technique and its contribution to communication research and development.

Admiral Hooper has served with distinction in many important posts, not only directly for the United States Navy, but also in the field of international radio. He was Chief Engineer of the Federal Radio Commission during 1927-1928; Director of Naval Communication, 1928-1934; Director of the Technical Division of Naval Operations, and the Chairman of the Naval Research Division during 1934-1939. He also served as United States delegate to the International Radio Conference at The Hague, Bucharest, Lisbon, Cairo, Santiago, Chile (1940). His honors include the Navy Cross, Mexican Campaign Medal (U.S.), Legion of Honor ((France), Victory Medal World War I, International Radio Engineers Gold Medal (1934), and the Marconi Medal of Merit (1939).

Raytheon Selects Mims

M. P. Mims is now in charge of Sales Engineering and manager of Watertown Plant, Watertown, Mass., for the Electrical Equipment Division, Raytheon Manufacturing Company, as announced by G. E. M. Bertram, General Manager.

M. P. Mims

Mims is well known throughout the radio distribution field, having owned and operated Mims Radio Company, Texarkana, Tex.-Ark. for many years. The development, production and marketing of rotary beam antennas was his accomplishment. The address is 12 Watertown St., Watertown, Mass.

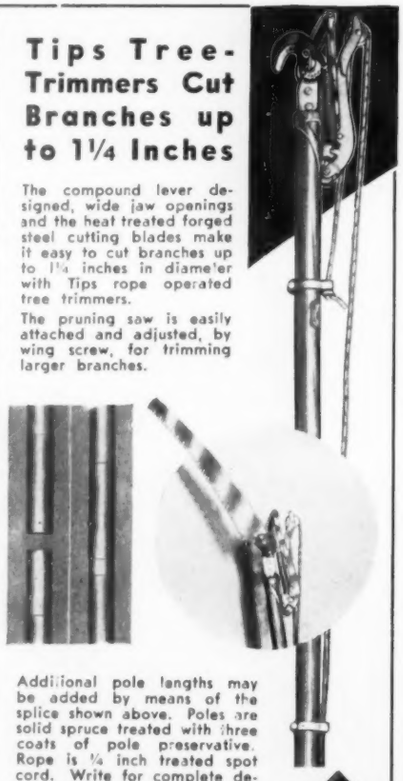
New Edition On Telephone Cables

A new and more comprehensive edition of TELEPHONE CABLES has recently been issued by the Western Electric Company to replace an older edition bearing the same name. Designed to familiarize the communications industry with the company's cable products and to present other pertinent tabular and factual data of importance to communications engineers this 37-page booklet describes lead-covered, jute-protected, wire-armored, tape armored, and switchboard cable in more detail than the former edition. It is also more generously illustrated with photographs of historical manufacturing and installation operations and with diagrams showing interesting structural features. Showing a new type of lead-covered cable developed since the appearance of the previous booklet, the new TELEPHONE CABLES also describes new materials which replace such critical products as silk and tin in the "CL" type of switchboard cable.

Tips Tree-Trimmers Cut Branches up to 1¼ Inches

The compound lever designed, wide jaw openings and the heat treated forged steel cutting blades make it easy to cut branches up to 1¼ inches in diameter with Tips rope operated tree trimmers.

The pruning saw is easily attached and adjusted, by wing screw, for trimming larger branches.



Additional pole lengths may be added by means of the splice shown above. Poles are solid spruce treated with three coats of pole preservative. Rope is ¼ inch treated spot cord. Write for complete details and prices.

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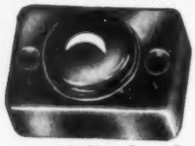

No. 10—beautifully finished black bakelite, new improved positive spring contacts. All metal parts rustproof and insulated. 1⅝" x 1⅛" x ⅞" high.

No. 11—with handsome metal escutcheon to hold name card. Same fine construction as No. 10 above.

Murdock also makes Precision Telephone Sets, Plugs and Radio Phones. Write to Dept. 87 for Catalogue.

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John A. Campbell To Represent Kellogg In Iowa

John A. Campbell, telephone man since 1903, was recently appointed a Kellogg Switchboard and Supply Company representative in Iowa. Mr. Campbell's efforts will augment those of Jim Trevillion, long a familiar figure to Iowa's telephone folks, and will be confined principally to the northern portion of the state.

John A. Campbell

John entered the telephone field forty years ago, as an employee of the Winona Telephone Company of Winnimac, Indiana. Since that time, he has been consistently associated with the industry and, as a result, is conversant with its every phase.

During his years in the telephone business, John Campbell has served in a great many states and made a host of friends. In his new position as Kellogg service representative, he is certain to add many new names to that already imposing list.

Names Hammel On Regional WLB

On February 6th, 1943, F. J. Hammel, personnel relations manager of the Western Electric Company's Kearny Works, was appointed a member of the Regional War Labor Board No. 2 which was set up by the National War Labor Board to give rulings in labor disputes and in voluntary wage adjustment cases in New York State and Northern New Jersey.

Mr. Hammel is a representative of industry on this board which functions as a supreme court for labor disputes and which passes on virtually all pay increases and reductions in the region. Besides representing industry, other members of the Regional War Labor Board represent the public, the A. F. of L. and the C. I. O.

Booklet on Care of Tools

As a contribution to tool conservation, Mathias Klein & Sons, 3200 Belmont Avenue, Chicago, have issued a pocket-size booklet on the proper care of tools containing suggestions for their safe use. This booklet is illustrated with many sketches and contains valuable suggestions on how to make tools last longer and give better service. A copy will be sent without charge by the manufacturer to anyone who can make use of it.

Davison Chemical Report

Mr. Chester F. Hockley, president and chairman of the board of the Davison Chemical Corporation, reported May 1 on the net earnings of the Corporation for the nine months ending March 31, 1943. After all charges and reserves for taxes were accounted for, the net earnings amounted to $1,084,431.00. The earnings for the nine months are equivalent to $2.11 per share, and compare with $1.35 per share or $695,734.00 for the same period in 1942. No provision has been made for any effect on the earnings of the Corporation which may result from Government contract renegotiations nor for any special reserves or year end adjustments at the end of June when the new fiscal year starts.

The sales volume for the nine months has shown an increase of 53% (percent). The war has caused an increase in demand for old products, but development of new products and new uses for old products accounts for a substantial part of the increase. Operating expenses have naturally shown an increase in line with expansion and construction program. Taxes of the Corporation are considerably higher than for the preceding year. The effect of these increases on the total earnings has been offset by the increased volume.

Army-Navy "E"

Presentation of the Army-Navy "E" Pennant to the Laboratories Division of Federal Telephone and Radio Corporation manufacturing affiliate of International Telephone and Telegraph Corporation, was made April 20 at the International Telephone Building, 67 Broad Street, New York City. Colonel Ira H. Treest of the U. S. Army Signal Corps, was the principal speaker.

The award was accepted for the company by Major General George S. Gibbs, Vice Chairman of Federal Telephone and Radio Corporation, and for the employees of the Laboratories by W. E. Boehle.

Kellogg's Jim Trevillion Is A Flying Phone Man

Jim Trevillion, Kellogg service representative in Iowa, is as busy these days as the proverbial one-armed paper hanger. Members of the telephone industry have always rated him a hustler and his energy has won him an imposing following. Now, in discharging additional duties directly associated with the war effort, he is proving himself equally valuable to Uncle Sam.

Long an aviation enthusiast, Jim has for some time been the proud possessor of a pilot's license. Availing himself of every opportunity to add to his flying hours, he soon became as proficient a pilot as he was a telephone man. When our Government created the Civilian Air Patrol, he was among the first to offer his services, which were promptly accepted. Since that day, leisure hours and Jim have become strangers—but he loves it!

Exide Wins Renewal of Army-Navy "E"

The Electric Storage Battery Company, manufacturer of Exide batteries, has been awarded the second star symbolizing six more months of production vital to our armed forces. The men and women of Exide have achieved this signal honor by continuing their war production in such volume as to justify this renewal.

Raytheon Units Win Army-Navy "E"

The Raytheon Manufacturing Company, Equipment Division, Power Tube Division and Radar Division at Waltham, Mass., and the Company's Small Tube Division at Newton, Mass., were among the latest producers of military radio equipment to win Army-Navy "E" awards for excellence in war production.

Consolidation Refused Pennsylvania Companies

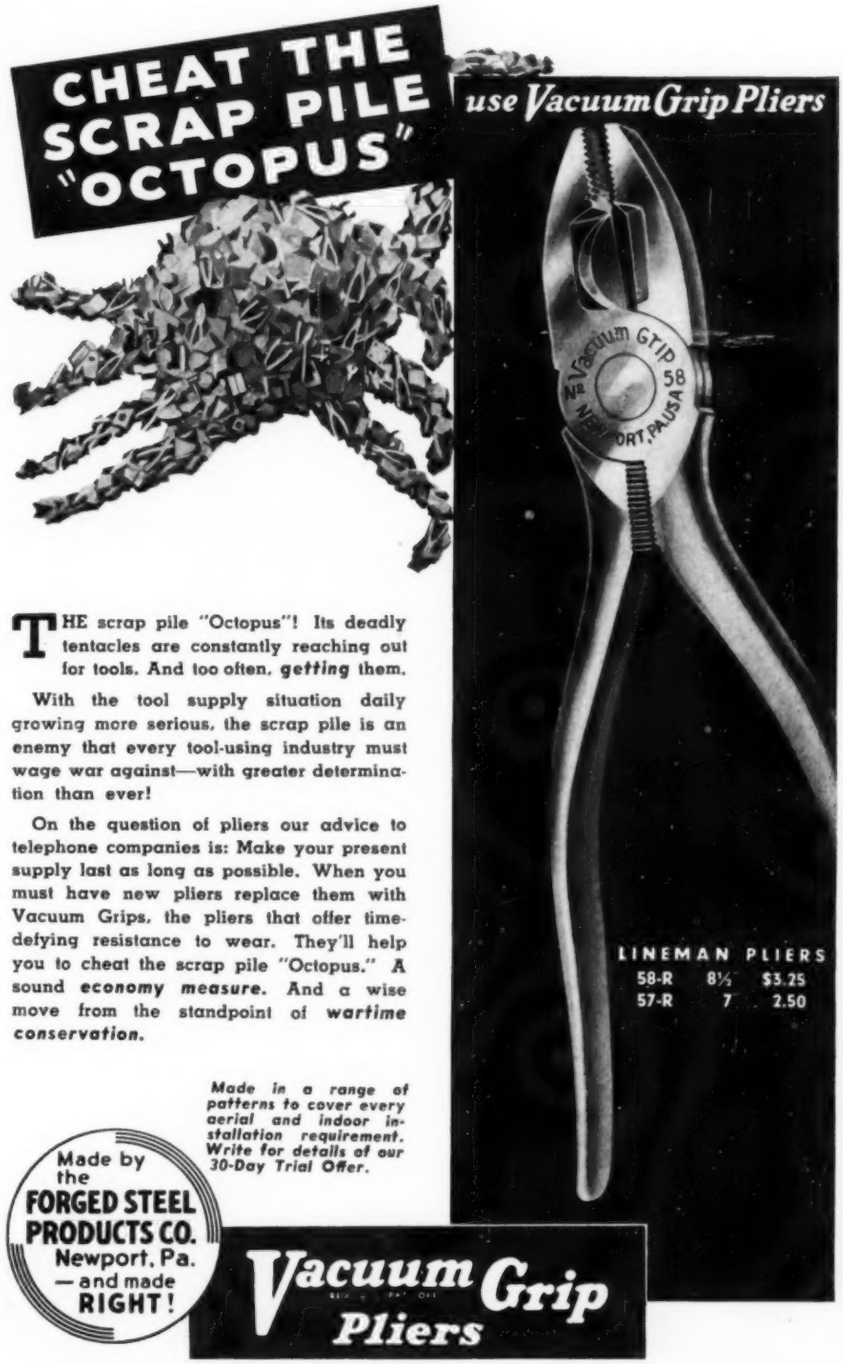
The Public Utility Commission of Penn. has refused to approve the merging of Erie County Telephone Company into Pennsylvania Telephone Corporation. The consolidation was to have been effected by the sale of all of the capital stock and corporate property of Erie to Pennsylvania for a consideration of $88,398.83.

The agreement between the two companies provided for the payment by Pennsylvania of $30,450 in cash for the capital stock of Erie, the assumption by Pennsylvania of total liabilities of Erie amounting to $56,300.86 and payment by Pennsylvania of other acquisition costs totaling $1,647.97.

The Commission agreed that a consolidation of the two companies is desirable, but is of the opinion that a consolidation under the proposed terms and conditions would adversely affect the public interest.

You're Lucky—

to have Free Press, Free Delivery and many other things . . . so don't fret when your magazines or newspapers are late . . . Uncle Sam is doing his best.



THE scrap pile "Octopus"! Its deadly tentacles are constantly reaching out for tools. And too often, *getting* them.

With the tool supply situation daily growing more serious, the scrap pile is an enemy that every tool-using industry must wage war against—with greater determination than ever!

On the question of pliers our advice to telephone companies is: Make your present supply last as long as possible. When you must have new pliers replace them with Vacuum Grips, the pliers that offer time-defying resistance to wear. They'll help you to cheat the scrap pile "Octopus." A sound *economy measure*. And a wise move from the standpoint of *wartime conservation*.

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Ask the distributor of *Crapo* Galvanized Products near you or write direct for further information!

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Federal Telephone and Radio Celebrate Anniversary

The Telephone Division of Federal Telephone and Radio Corporation, Newark, manufacturing affiliate of International Telephone and Telegraph Corporation, this month is celebrating the second anniversary of the division's telephone equipment manufacturing program at East Newark. Within the span of the past two years the original staff of 25 persons has grown to more than 1,300.

Pictured, above are the Telephone Division's "pioneers:" (left to right) I. C. Pease, Paul Penhune, George Hyman, J. E. Fox, H. J. Slass, L. B. Haigh, F. Waldhorst, Florence Bolla, Ted Smith, Katherine Andresen, S. V. C. Scruby, C. Boehlen, H. P. Lankow, N. Masine, F. Vedell, R. Bernstein, B. C. Brandt, R. O. Hall, M. G. Kolmes, D. L. Solomon, C. Walker, and J. A. Nelson.

Not present for the picture were W. Hatton, J. McDonough, L. Edenburg, B. R. Sprague and Roy H. Workman.

Dunn Named By Illinois Commercial

Corwin Dunn recently was appointed as active manager of the Kewanee, Ill., district of Illinois Commercial Telephone company, it was announced last month by C. R. Brown, of Springfield, vice president and general manager of the company. Mr. Dunn has been district engineer of the Kewanee office for several years and for the present will also continue his duties as engineer.

Fred E. Freers, manager of the district for the past nine years since 1934, resigned as manager which made necessary the new appointment.

The district includes exchanges at Kewanee, Bradford, Buda, Camp Grove, Castleton, Elmira, Neponset, Toulon and Wyoming.

Walter C. Polk

Walter C. Polk, 74, for many years an engineer for Independent telephone companies, died in a hospital at Asheville, N. C. early in April. He engineered and constructed the old Kansas City Home Telephone Company which was taken over in the early 1920s by the Southwestern Bell Telephone Company.

Mr. Polk lived in Kansas City, Mo. until he became an invalid some 17 years ago.

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Philco Promotes Heinritz

M. W. Heinritz of Trenton, N. J., has been named vice president in charge of the Storage Battery Division of Philco Corporation, it was announced during April by Larry E. Gubb, chairman of the board of directors.

Mr. Heinritz, who joined Philco in 1922, was born in Clinton, Mass. During the last war he served in the Signal Corps and then returned to the Worcester Polytechnic Institute from which he was graduated in 1920. Mr. Heinritz's first assignment with Philco was the sale of storage batteries to the mining industry in northern West Virginia. Thereafter he was transferred to the Pittsburgh and, later, to the Chicago branch offices to handle sales.

M. W. Heinritz

In January, 1938, he was named general manager of the Philco Storage Battery Division with offices in Philadelphia. Under his leadership the activities of the Storage Battery Division grew to such an extent that increased production facilities were needed. Accordingly, a plant with much larger capacity was obtained in Trenton, N. J., and the Battery Division of the Company was moved there late in 1941.

In recognition of its war production record, the Battery Division was awarded the Army-Navy "E" on October 7, 1942, and received the "E" Star on April 16, 1943, for continued production excellence during the intervening six months.

Receives Vail Award

Jennie Crouse, operator at Alvin, Ill., for the Rossville Telephone Company, was awarded the Illinois Bell's bronze Vail Medal Award and $100 in cash for an outstanding act of public service during 1942.

Miss Crouse, cited for "courage, initiative and effective use of telephone facilities in summoning aid and alleviating anxiety in the time of public disaster," was alone in her Alvin home where she operates a one-position magneto switchboard, when a tornado hit the town. Realizing the entire town had suffered severely and that few telephone lines remained in service, Miss Crouse turned the telephone office into first aid and information headquarters, remaining on duty from noon on March 16 until 2 a. m. the next day.

FCC Statistical Yearbook Available

Comprehensive 1941 statistical data covering the communications industry have been released in book form by the Federal Communications Commission. The volume is entitled "Statistics of the Communications Industry in the United States, year ended December 31, 1941." It includes data shown by Class A and Class B telephone companies subject to the Communications Act, as well as various summaries and tables and may now be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C. at 30c a copy.

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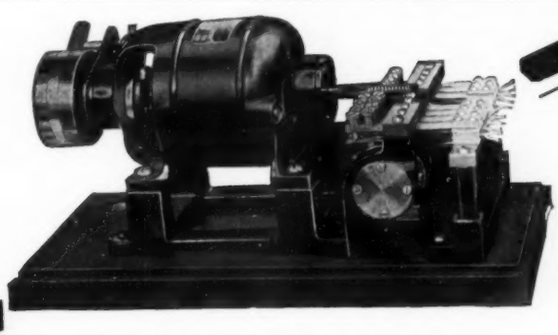

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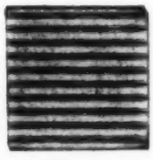

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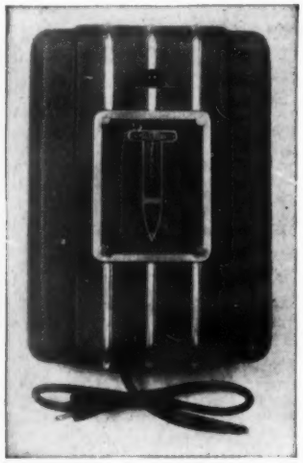

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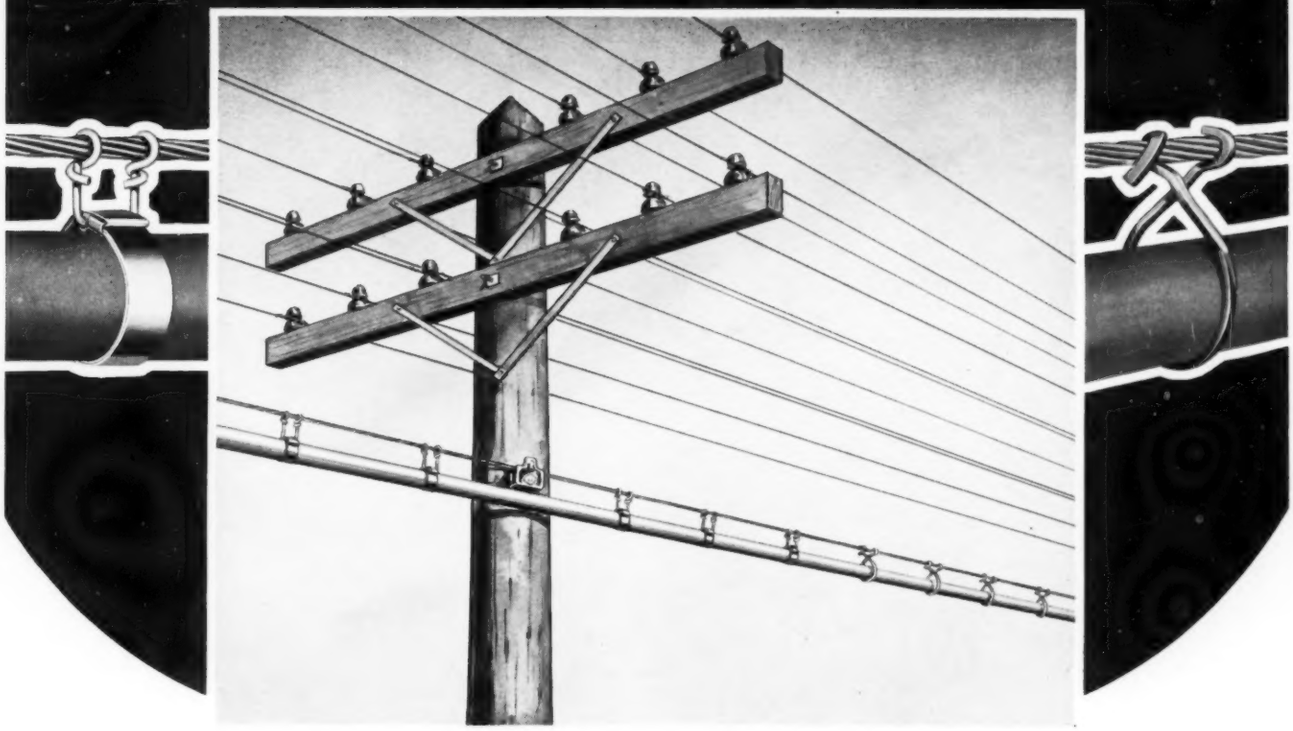

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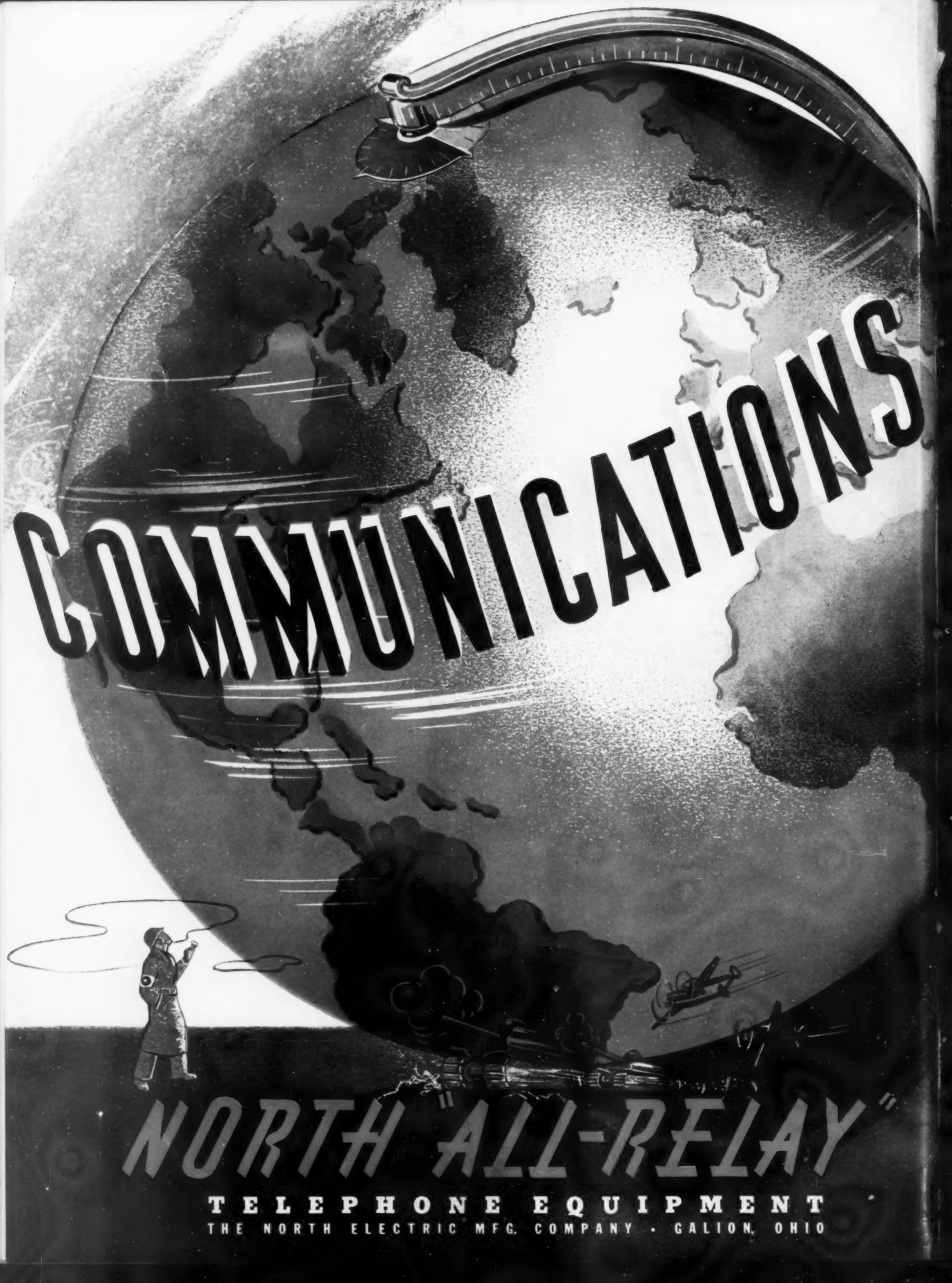

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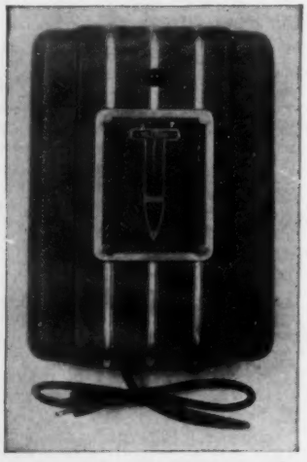

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